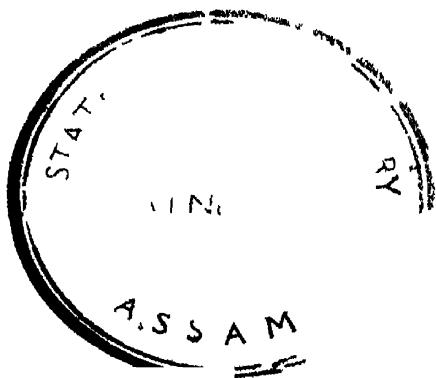
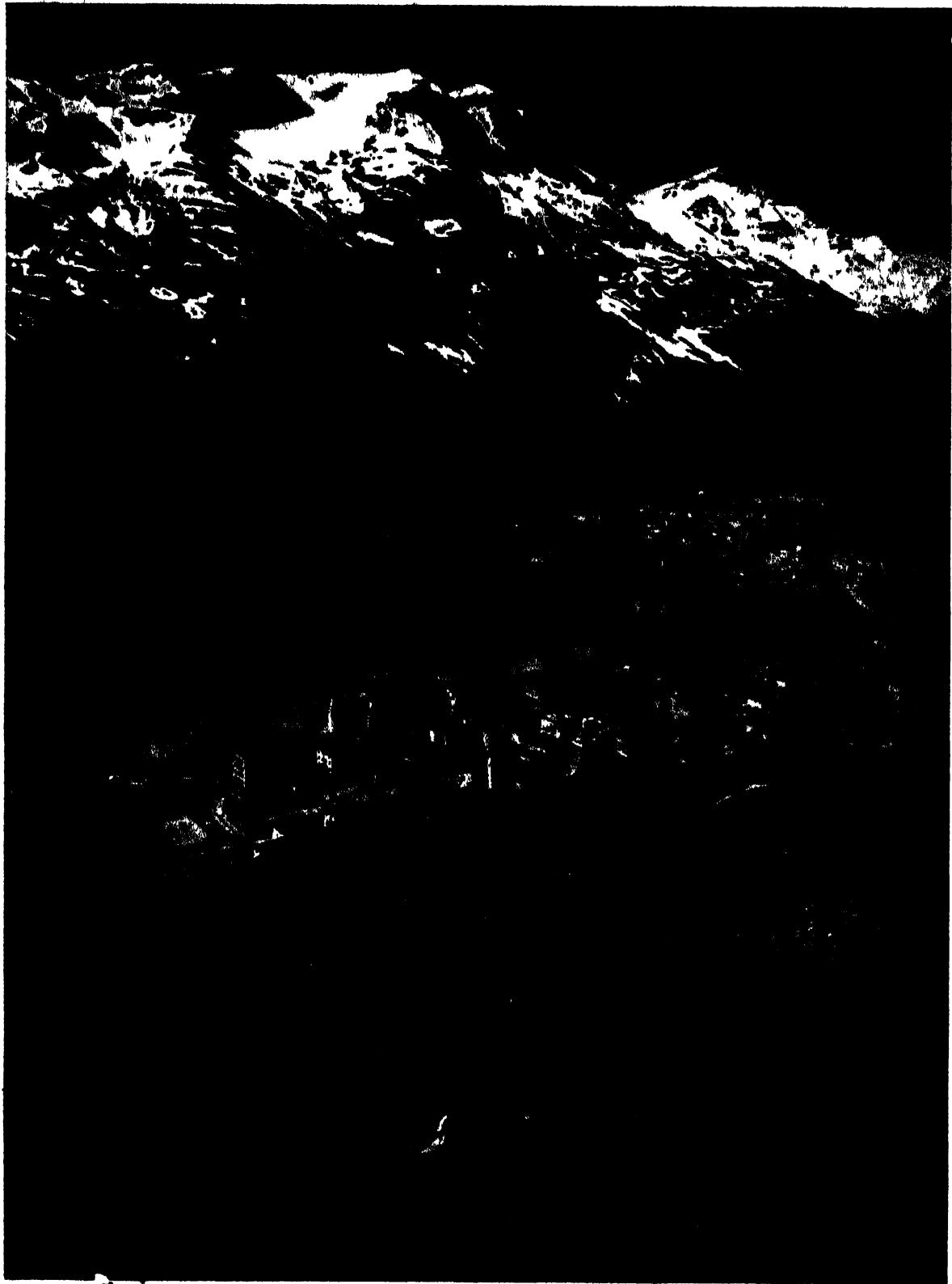


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GEOGRAPHY AND MAN







ST. MORITZ, SWITZERLAND
Photo St. Moritz Information Bureau, Albert Steiner

(U.109)

Frontispiece

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GEOGRAPHY AND MAN

A PRACTICAL SURVEY OF THE LIFE AND
WORK OF MAN IN RELATION TO
HIS NATURAL ENVIRONMENT

607
P.R.D.

Advisory Editor

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ASSISTED BY SEVENTY-FIVE
EMINENT AUTHORITIES

VOLUME I

THE HERITAGE OF MAN: EUROPE

SECOND EDITION



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PREFACE TO THE SECOND EDITION

GEOGRAPHY AND MAN was planned to show Man in his natural environment adapting and developing the resources around him to increase his well-being and comfort. Political boundaries as such, in a work of this kind, are therefore incidentals which are useful only because they enable us to label groups of people under such names as French, German, Italian and so on. For this reason, despite six years of war and the changes in political boundaries which inevitably follow such conflicts, these volumes have needed but limited revision. Indeed, the only major changes the war has forced on the Editor are alterations to some of the maps to show revised frontiers in Europe, Asia and Africa, and transposition of text where a community has become subject to the political domination of another government.

The statistical information in the volumes required rather more delicate treatment. Most of the pictorial statistics are set out under such headings as population, mineral and industrial products, and imports and exports. During and since the war not every country has held a census of its population and therefore official figures to indicate which areas of the world are more, or less, populated are lacking. In some instances, however, responsible authorities have been able to issue reliable estimates and these have been inserted in the text where appropriate. The latest available statistics relating to the other headings mentioned above merely show that Man is struggling to make up shortages of food and goods resulting from the war. They scarcely give a true picture of human endeavour in normal times and even tend to distort it. The pre-war statistics relating to productive capacity, imports and exports have accordingly been retained for purposes of comparison.

One important addition to this edition of GEOGRAPHY AND MAN calls for comment. So rapid has been the development of air-travel during the past decade that it has become of vital significance in the study of geography. The world-maps we have so long been accustomed to study are losing their value and will have to be replaced by others in which a different method of projection has been employed. We shall have to realize that while it may be convenient for studying sea-routes to have the globe laid out in a flat plane, such projection is actually misleading to the student trying to understand, to take a simple example, why aircraft flying from Shannon Airport, or from London, direct to New York pass over Newfoundland. On a globe it is clear that Newfoundland does lie on the direct route from the British Isles to New York, but globes cannot be carried round with the same ease as atlases, and map-makers, therefore, must use a type of projection that will make air-routes more comprehensible to us. A study of air-routes on a map of any kind, however, does not always seem to

make sense. Although the seemingly obvious route for an aeroplane is the shortest distance between two points, it is not always the most practicable. Air-currents, seasonal weather, fuel-carrying capacity of the aircraft: these are some of the problems of the air-navigator, and to enable readers of the volumes to get the relationship between air-travel and geography in its true perspective we have introduced into the first volume an entirely new section on this most important subject.

Finally some mention should be made of the pains taken to ensure that the whole work bears the stamp of authority. No more need be said than that among the eminent geographers, travellers and others without whose combined efforts *GEOGRAPHY AND MAN* would never have been born were the following—

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W. M. MACMILLAN, M.A. (Oxon.), F.R.Hist.S.	

In other words, the various countries have been described by people with first-hand knowledge of their subject and the ability to impart that knowledge with colour and vigour.

THE EDITOR

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INTRODUCTION

DURING THE PAST TWO CENTURIES the facilities for moving rapidly from one place to another have increased apace. The stage coach has given way to the motor car and the train; the sailing ship has disappeared before the modern steamship. To encircle the globe was, even in the latter years of the nineteenth century, no mean undertaking, yet, to-day, only fifty years later, it is a commonplace of travel. Recent years have witnessed a still greater revolution in speed consequent on the technical and commercial development of airways which have put the most distant part of the world no more than a few days' journey from home.

Two facts emerge from this phenomenal change. The first is that one half of the world knows far more of the way in which the other half lives. The second follows as a direct consequence. Proximity in point of time lends an appearance of proximity in point of space. Antarctica, unexplored half a century ago, was inaccessible because of its remoteness; to-day under suitable weather conditions it would be possible to land there in a few days. Now that the whole world is potentially within our grasp and access to it is growing daily easier, man's desire to know more about his neighbours as well as the more remote races of men is increasing.

GEOGRAPHY AND MAN is offered as an unbiased review of conditions in every corner of the globe—of the heritage Nature has bequeathed to man and the progress man has made in adapting himself to his environment, and in adapting his environment to the needs and desires of his own person. Accuracy is never sacrificed to romance, nor are scientific discoveries mentioned except when they are of practical benefit to men working and producing in their natural environment.

To-day every corner of the globe has been penetrated, every country of the world explored, the manner of life and customs of every people studied. To the western world it would seem that the data of geographical knowledge are complete. Even so, knowledge is still increasing; the results of observation are being examined, fresh facts are coming to light. What is still more important, even though we know our world in the sense of knowing its physical features and the appearance of the people who live in it, there still remains the "how" and the "why" to be examined more fully. In the province of pure geography, for example, the mystery of ocean currents has yet to be solved.

In the pages of GEOGRAPHY AND MAN we shall penetrate corners of the world forgotten for thousands of years and though when we arrive at the end we may still be imbued with the vain conceit, common to every race, that our own people are more favoured and more advanced than any who have gone before, we shall

INTRODUCTION

not fail to realize that there exist other races of a high degree of civilization, other cultures older than our own and other standards of living. The bare realization of that fact will lead us perhaps, as does every investigation into the nature of man, to a broader outlook and a greater tolerance.

The work falls into three natural divisions. The first of these (Part I in the Contents) is a résumé of the Heritage of Man, that is, the Earth, from which he has wrested a living by exploiting its natural resources, and fitted himself to the varying conditions by adapting himself to his environment. This division serves as an introduction to the second (Parts II to VII), which occupies rather more than two-thirds of the whole work and which comprises a detailed survey of the countries of the world. Although modifications have been necessitated by the special characteristics of different countries, throughout the compilation of this division a definite plan has been followed to accord with the twin ideas of social and economic life. In general, the first part of the space devoted to each country includes an account of the characteristic scenery and the main features of the physical relief, with special reference to the life of the rural people, who are depicted living and working, with the countryside as the background of their activities. There follows a description of the capital city and any other towns which seem to be of special importance, in which their intrinsic interest is stressed as well as their economic or commercial importance in the life of the nation. Another part deals with the wealth of the country judged from the standpoint of natural resources, industries and commerce. Here the State is treated as a productive unit, thus completing the picture of its social being. Such topics as rural and local industries and contrasting methods of working the land have been studied with particular care, and, in order that the volumes shall prove a reliable work of reference, a short synopsis of essential facts and figures has been given in connection with the countries treated.

Just as the first of the three divisions reviews the data on which man has to work and the second surveys in detail conditions in every part of the world, so the third (Part VIII) indicates the manner in which man has been able to utilize the materials with which Nature has provided him. It is the economic interpretation of Nature's provision for man and is in fact a deduction from material given in the preceding two divisions. Here will be found some account of man himself and of how he obtains food and raiment by exploiting through agriculture the various resources of the soil; of how he extracts the minerals and precious metals; of how man trades with man and of the influence transport exerts on trade; of the manner in which industry and manufactures, in recent centuries, have become distributed in the wealthiest parts of the world, thereby increasing the wealth and productivity of these regions, and illustrating the principle that wealth begets wealth in every phase of activity. An alphabetical list of geographic terms is included, both to show the relation between similar

types of scenic features which occur in different parts of the world under different names and also to explain factors that have resulted in the formation of such local features as deltas, deserts and swamps, to mention three examples.

The illustrations are an integral part of the work. They have been chosen to assist the written word in giving a picture of the country described. Just as the text is most concerned with the picture of a country's people working in the scenery typical of their land and with their social and economic background, so the illustrations preserve the unity by stressing the life of the people and their physical environment; they give a more vivid impression of the races which inhabit distant countries of the world than can be given by mere words. The photographs used are derived from over two hundred sources and selected from more than thirty thousand prints submitted. Many are derived from official sources, from Embassies, Legations and governmental representatives. Some are from the cameras of the travellers who have described the countries in these volumes, others have been taken by photographers of international repute. The acknowledgments made beneath each reproduction will be sufficient to indicate the assistance the Editor has received from every part of the world. An unusual feature of the illustrations is the number of charts depicting economic development of the more important countries, while the sketch maps will serve to indicate the chief cities of the country and the main lines of communication within it.

THE SCHEME OF THE WORK

VOLUME ONE

PART ONE. *The Heritage of Man*

Exploration—Modern Maps—The Earth in the Solar System—The Earth's Land Masses—The Earth's Crust—Geography and Aviation—Climate and Weather—Life on the Earth—Arctic and Antarctic Lands and Seas.

PART TWO. *Europe*

The Continent of Europe—The Countries of Europe.

VOLUME TWO

PART THREE. *The British Isles*

The Face of Britain—England—Wales—Scotland—Ireland—London and Edinburgh—Historic and Industrial Towns—Industries, Trade and Communications—Islands of Great Britain—Dominions and Colonies.

PART FOUR. *Asia*

The Continent of Asia—The Countries of Asia.

PART FIVE. *Africa*

The Continent of Africa—African Native Peoples—The Countries of North Africa—The Lands of Intertropical Africa—British East Africa—The Federation of Rhodesia and Nyasaland—The Union of South Africa—Islands of the Atlantic.

VOLUME THREE

PART SIX. *The Americas*

The Continents of North and South America—Canada and Newfoundland—The United States of America—Mexico—The States of Central America—The States of South America—The West Indies.

PART SEVEN. *Australasia*

Australia—New Zealand—The Pacific Islands.

PART EIGHT. *Man's Work and Industry*

Geographical Distribution of Man—The World's Agriculture—Forests and Fisheries—Industry, Trade and Transport—The World's Mining Industry—Man's Struggle against Nature.

DICTIONARY OF GEOGRAPHIC TERMS

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CHAPTER ONE

GEOGRAPHY AND EXPLORATION

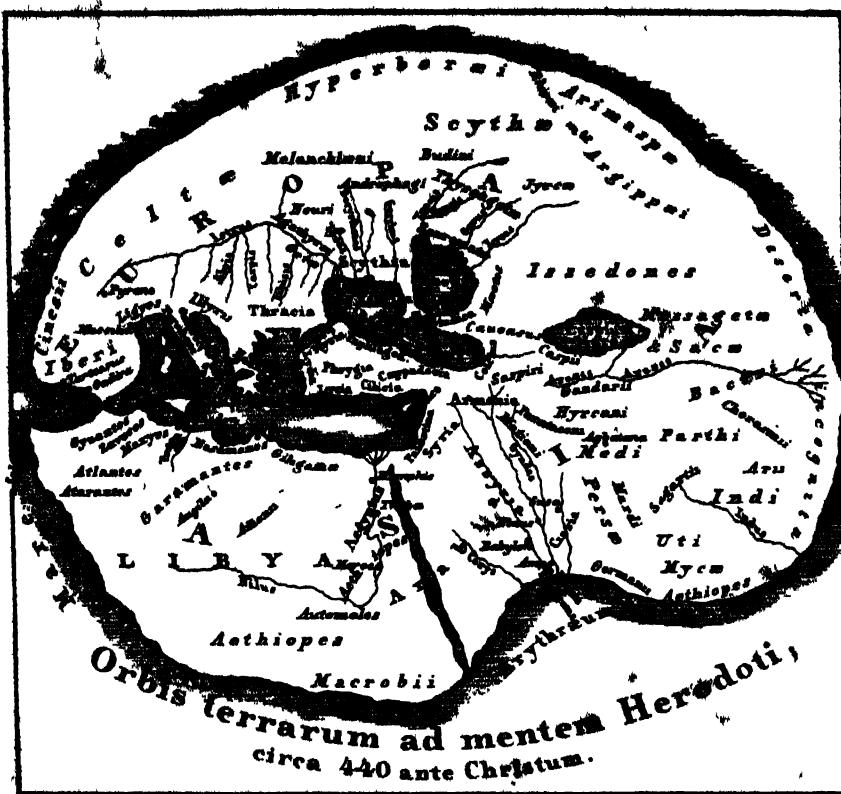
WHAT is Geography—and how is it possible to arrive at some general conception of the world? Even when men are in a very low state of mental development they may sometimes contemplate the Earth, or even the Universe, with vague questionings. Some at least of the Blackfellows of Australia, as we are told, have arrived at the same conception of a very limited habitable world surrounded by a circumambient Ocean, which was popular among the ancient Greeks even down to the time of Herodotus—though of course the world of the Greeks was a good deal larger than that of the Blackfellows. Common sense seemed to demonstrate by daily experience that the Earth is flat on the whole, though it has ups and downs: and whenever one reached the edge there was water. Obviously also the Earth, whatever its size, is overspread by the firmament, in which the Sun and Moon and planets go through their mysterious wanderings.

There is a long step between this primitive conception and the idea that the Earth may not be a sort of plate or table, but a ball, comparable perhaps to those other balls the Sun, the Moon and the planets. "Orbis Terrarum," the round world, meant to many early thinkers an object round like a plate, not like a ball. Whether it had come into existence by swirlings of primeval chaos—as some of the early Greek philosophers thought—or by deliberate divine planning by an omnipotent will, was a topic well worthy of discussion. But there the Earth was—and its present state, if not its origins, could be investigated.

Why Early Geographers were Inaccurate. Speculations, scientific or theological, about the Universe are attractive, and universal in all societies which have reached any sort of civilization. But the more limited inquiry about the actual shape and dimensions of the Earth falls to the task of the geographer. Unfortunately the early geographer was too often a theorist, more set on producing a neat logical scheme than on accumulating and comparing scraps of evidence that often appear contradictory. It is easier to generalize than to sort

evidence—more particularly when some of that evidence is suspected to be erroneous. How far could the astronomer be trusted—and how much of many travellers' tales was a "traveller's tale" and no more? A few geographers believed in the test of "*solvitur ambulando*," and did their best to go round so much of the world as was accessible to them. But man is short-lived, and always has to turn back somewhere—not only if he has got to an illimitable ocean, but often because he has reached icy mountains, or waterless deserts, or savage tribes who deny passage. The conscientious geographer had often to write "*terra incognita*" on the edge of his map, and to fall back on speculation.

Maps came into being quite early—there are some fragments of ancient Egyptian drawings preserved, and the Greeks of the sixth century sometimes engraved them on broad sheets of brass—such as that which Aristagoras exhibited to King Cleomenes, in 500 B.C., or which was engraved the entire circumference of the Earth, with all the seas and rivers. But none of these early efforts has been preserved and to form some idea of what Hecataeus or Anaximander drew, we can only go to fragmentary written indications. There were, no doubt, strange efforts of combination, in which ideas drawn from Homer and the legendary sources were mixed with data contributed by contemporary travellers and merchants. Writing a long generation later, Herodotus knew nothing westward outside the Mediterranean. Sure that the Celts were the remotest people of the world, he did not believe much in stories of tin-producing islands beyond the Straits of Gibraltar. He knew of the Danube, but thought that it rose by the Pyrénées, and had seen the Nile, but believed that its upper course was constituted by the Niger, which also had crocodiles! And eastward and northward once outside the limits of the Persian Empire he got into vague deserts, with gold-hoarding ants and one-eyed tribes, past whom runs mysterious, "journey to the Issedonians," some indication of a caravan route across Tartary. That round all was the circumfluent ocean, c



THE WORLD AS KNOWN TO THE ANCIENT GREEKS
Herodotus knew nothing westward of the Mediterranean and thought that the Danube rose
in the Pyrenees
Courtesy British Museum

which Homer sang, he would not believe, but certainly to west and south there were illimitable wastes of water. He refused to credit a circumnavigation of Africa by certain Phoenicians, for stated reasons, which we can now see to be misconceived. Altogether it was a small world though much larger than Homer's: and though his beat was only from southern Italy to Babylon, he added many useful, *if some erroneous, contributions to human knowledge.

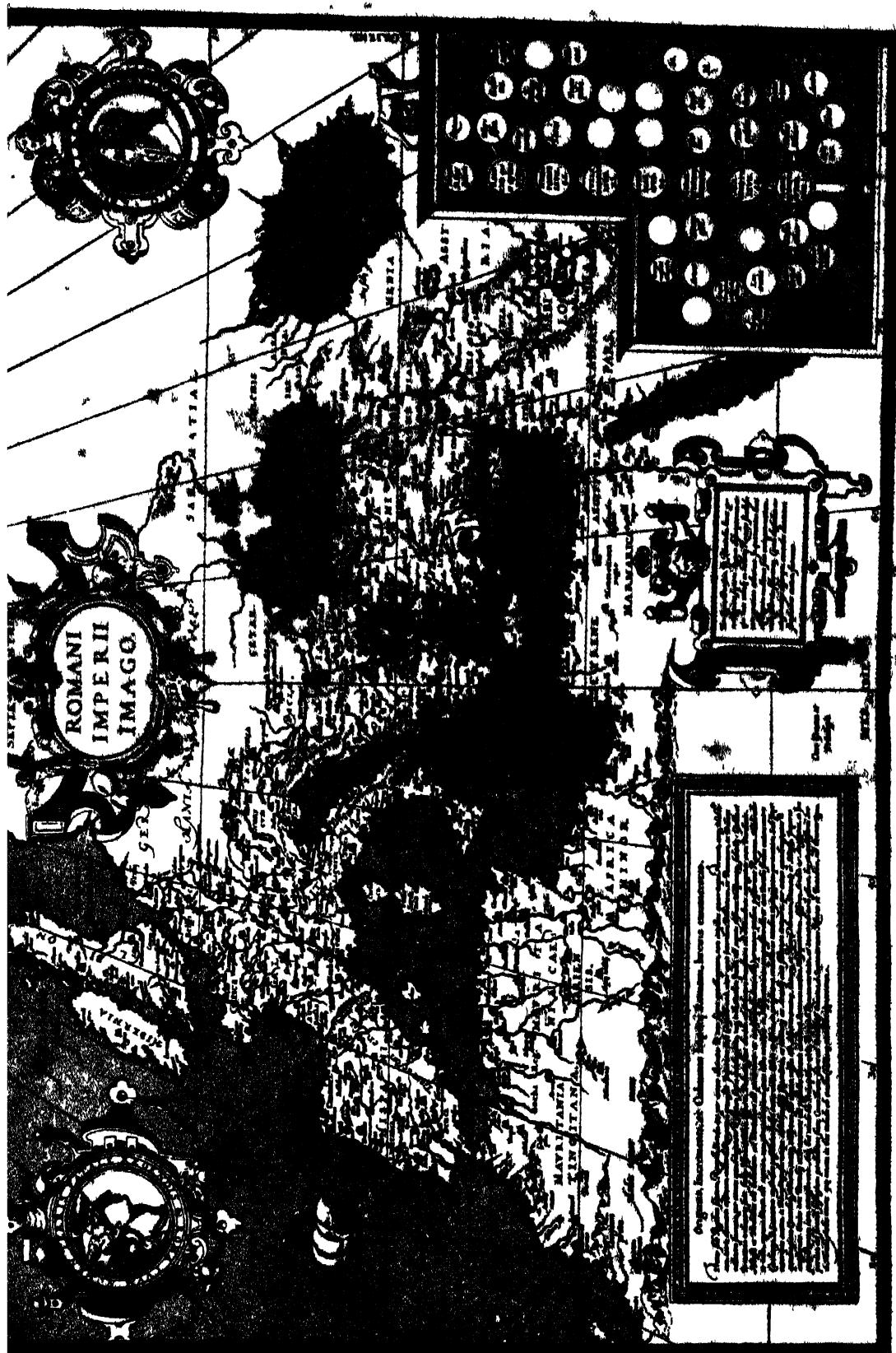
How the "Known World" Grew. In the next two centuries the conquests of Alexander the Great pushed the limits of geography far to the east, and the contemporary voyages of Pytheas of Marseilles into the Western Ocean gave a clear account of Britain, and a glimpse of "Thule." Meanwhile Carthaginian seamen had crept down the west coast of Africa, and had seen "gorillas" somewhere beyond Senegal, according to Hanno's famous tale. And after the rise of the Greek kingdom of the Ptolemies in Egypt, navigation from the Gulf of Suez down into the Indian Ocean, which had got no farther than Arabia in the days of the Pharaohs, had extended eastward to Mal-

abar and Ceylon ("Taprobane"). By the beginning of the first century of the Christian Era the "known world" had about doubled itself in extent.

Subsequent extension was less rapid—the Roman campaigns in Germany gave only a second-hand knowledge of Scandinavia and the Baltic lands, and a vast extension eastward just failed to materialize in the second century, when the temporary advance of the Chinese Empire across central Asia did not bring about the contact between East and West that might have been expected. A Chinese general once reached the Caspian about A.D. 100–102, and a knowledge that there was a great civilized empire—"another China"—somewhere to the west came to his master. Similarly the Roman of the Antonine

period knew of "Serica," the silk-producing realm, far to the east, beyond the great central Asian deserts, but not in accurate detail. Envoys—perhaps only merchants—had struggled across them to the courts of Augustus and Marcus Aurelius, if we may trust notes of western writers: but there was a long gap in the communication after the second century, and the reciprocal knowledge of the two parties was vague. This is best shown by the very inadequate evidence for knowledge of China shown in the works of Ptolemy, the greatest of all Roman geographers, who wrote at Alexandria, about the year A.D. 139, his great book containing more than 2000 names of localities, of which nearly half were outside the old "known world" of earlier inquirers.

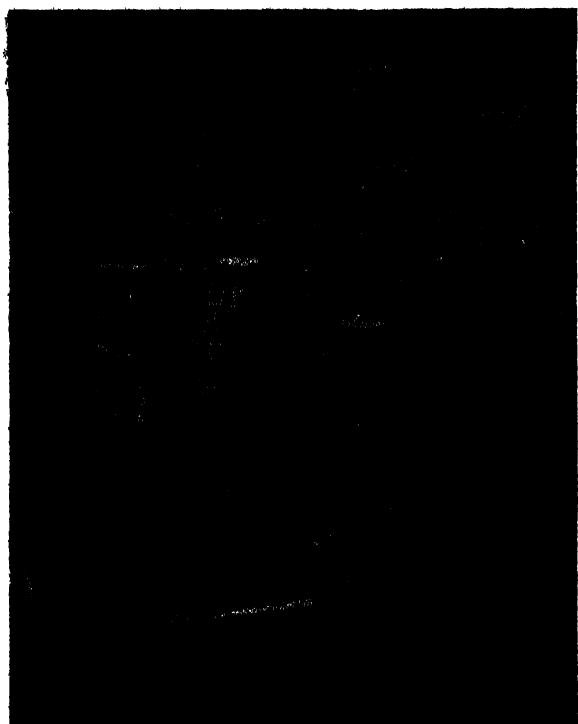
So it was with the Chinese, though pilgrim-travellers crossed the central deserts and investigated India, Ceylon and Afghanistan, searching for relics of Buddhist primitive lore. They never got far westward, and only heard of civilized Europe at second-hand. The Romans, in their prime, did not know much more of China than that it was a country from which the silk



Fedorenko, the greatest of the Russian Geographers, worked at Alexandria about A.D. 800. The Ptolemaic knowledge remained more than seven centuries, over half of which were outside the "Hellenic world" of earlier inquiries. Fedorenko's knowledge was lost in the Balkans, and his great work approached its acmeency for 1500 years.

came, in devious ways. It was not till some centuries later, when the Roman Empire had fallen into decadence, that another precarious touch between East and West was established by the Nestorian missionaries, who drifted across the wastes to Singanfu, leaving small Christian establishments in many places by the way. Just as the first slight connection was broken by the Huns in the fourth century, so was the later one by the expansion of Islam in the eighth.

Knowledge and Theories of Ptolemy. Claudio Ptolemaeus, whose works display a knowledge of the ends of the Earth such as no other geographer was to achieve for some twelve hundred years, was no traveller, but primarily an astronomer and a mathematician, dwelling at Alexandria in the days of Hadrian and Antoninus Pius. He left to the world not only his meritorious geographical compilations, but a system of astronomy which was to hold its own down to the sixteenth century. He believed in a spherical Earth, and condemned those who clung to the idea of flatness, but he was "geocentric" in his notions, i.e. thought that the Earth was the centre of the system of the Universe, and that the planets revolved around it.



RUINS OF ANCIENT ALEXANDRIA

These remains were excavated at Ramleh, near Alexandria, the home of Ptolemy, whose map of the Roman Empire is reproduced on the previous page.

Photo: Associated Press

The other conception of the Universe, which made the Sun the focal centre, adumbrated by certain early thinkers, the "heliocentric" theory, was as alien to Ptolemy's thoughts as the old idea of the flat round Earth. Being a mathematician, he calculated longitudes and latitudes for his spherical Earth, and concluded that his account of known lands and seas did not cover anything like the whole of it. There must be untold breadths of *terra incognita* and *Mare incognitum* to cover its whole surface, for he estimated its circumference at 180,000 stades, i.e. about a ninth more than its actual girth. What lay west of Portugal and east of China he did not know—at least a broader expanse of land and water than the known surface between the Iberian peninsula and the farther side of India and China.

Ptolemy's queerest error was to invent an enormous southern continent shutting in the Indian Ocean, and making it an internal sea; for he thought that the southernmost points of Africa and of the Indo-Chinese peninsula were joined by a vast unknown circuit of dry land. On the other hand it is highly to his credit that he denied that the Caspian Sea was connected with the Arctic Ocean—an idea held by many of his predecessors. His limits of rather vague knowledge are in western Africa the Niger lands, and in eastern Africa the islands about Zanzibar and the Nile lakes: in northern Europe the southern parts of the Scandinavian peninsula, and "Thule"—perhaps Iceland, perhaps only the Shetlands—while Siberia and all the land north of the route across Tartary to China are completely *terra incognita*. Still this makes a very large area of known or half-known land. In a few centuries the known world was to shrink back into about half these dimensions, for the geographers of the early Middle Ages lost touch with all the remoter regions that Ptolemy catalogued to east and south. They had to be rediscovered by new and remote generations of explorers.

Why Knowledge Receded into Myth. As long as the Roman Empire, though in incipient decadence, remained dominant in the Mediterranean, free circulation from west to east was easy and continuous within its borders. Merchants moved everywhere from Alexandria to Britain, and Christian bishops covered untold miles while attending councils. There was, from the days of Constantine and Helena onwards, a great influx of western pilgrims to the Holy Land, some of whom have left record of their perambulations to the



MAP OF THE WORLD DRAWN ABOUT A.D. 1280

The Hereford Mappa Mundi clearly shows how poorly the knowledge of the geographers of the Dark Ages compared with that of the Romans. Jerusalem was made the centre of a world that was flat and rounded. With a radius calculated from the Holy City to the extreme edge of the world—the western point of Portugal—it was imagined that the exact size of the Earth could be calculated!

Courtesy British Museum

scenes of Our Lord's activities—already legends were beginning to grow up in the more famous sites of Galilee and Judaea, and relics of sur-

pising importance to be exhibited. But free travel broke down after A.D. 400, when the Goths and Franks had burst into the inland of

the Empire, and the Vandal pirate fleets began to appear by sea.

From the early fifth century onward circulation grew more and more difficult, and it is not too much to say that western European civilization came to a crash. By A.D. 550 Procopius, the most prominent literary man at Constantinople, was describing the ancient Roman province of Britain as divided into two parts, one of which, the western, is so infested by vipers and serpents and other venomous creatures that the moment a man enters it he dies. And he speaks seriously of a ferry for departed souls, which functions nightly between Armorica and the opposite coast of Britain, with ships full of invisible passengers. Yet Armorica and Britain had both been organized and civilized Roman provinces for four centuries! Antoninus of Placentia, at the western side of half-extinct civilization, was writing about A.D. 570 that annually Jordan, on the day of the Epiphany, stops running for an hour, rears itself up into a vast wall of water, and only plunges on when catechumens have been baptized. He had also seen fresh green nuts from India, brought to Suez direct from Paradise,

turned to marble! The edges of the world, well known to Ptolemy in A.D. 140, had receded into myth infested by folk-tales. And matters were made rather worse by the great Mohammedan inrush in the seventh century, which turned old Christian lands like Syria and Egypt into *Paynomy*, crossed only at long intervals by rare and trembling pilgrims, like the Frank Arculf and the Anglo-Saxon Willibrord, who spent untold months in Saracen prisons.

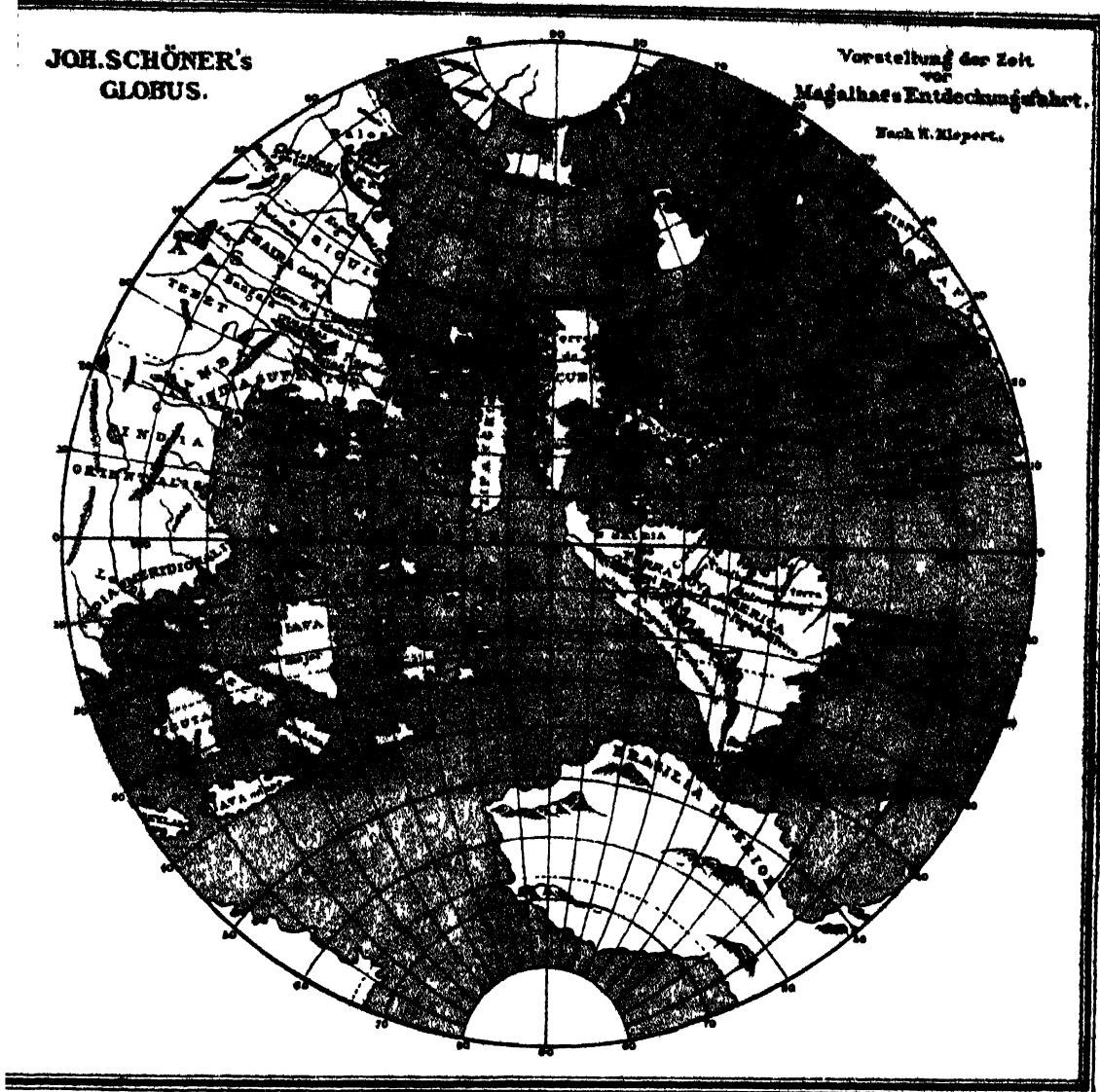
The World of the Dark Ages. Western Christendom in the Dark Ages reconstructed for itself a new round world, of a style which would almost have satisfied the earliest Greeks, save that it made Jerusalem and not Delphi the centre of the world. The most perfect description of the scheme of creation may be got from the "Christian Topography" of Cosmas, a merchant turned monk, who gave a full description of the Earth in the middle of the sixth century. It is rounded and flat, not spherical, "the blasphemous theory of the existence of Antipodes would make the Bible a lying book." The flat world has above it the arched heaven, which is glued to its edges as it were. The phenomena of night and day are



OLD FORTIFICATIONS AT ACRE

The destruction of Acre, the base of all caravan trade with Syria and the lands behind it, and the break up of the Mongol Empire marked a serious check to exploration

Photo Sport and General



THE IDEA OF THE WESTERN HEMISPHERE BEFORE MAGELLAN

The belief of the early voyagers in the short sea route across the Pacific to India can easily be understood from this reproduction by Kiepert of Schöner's Globe of 1515
Courtesy British Museum

caused by the Sun passing behind the lofty northern side of the Earth, a kind of screen which blots it out for certain hours. The habitable world is not precisely circular, for its bounded shape is much longer from west to east than from north to south. That its general tilt is from north to south is shown by the fact that rivers coming from the north, like the Tigris, flow furiously, while rivers like the Nile, coming up-hill from the south, creep with difficulty against the slope.

It must not be supposed that Cosmas dominated all European conceptions of the world:

some of his wildest theories, such as the great northern mountain which blots out the Sun, are peculiar to himself. But the ordinary view of the Earth was certainly that it was flat and circular. Its rotundity was deduced by many writers, from the biblical text (Ezekiel v. 5) "This is Jerusalem: I have set it in the midst of all the nations round about." So if a circle was drawn with Jerusalem as its central point, with a radius calculated by the distance from the Holy City to the extreme edge of the world—the western point of Portugal—the exact size of the round Earth could be calculated.



THE COAST OF CEYLON

Known to the seamen of the kingdom of the Ptolemies in Egypt, searched for Buddhist relics by Chinese pilgrim-travellers, Ceylon was yet deliberately misplaced by medieval map-makers to conform to the conception of a world with Jerusalem as its centre

Photo Fox

Map-making was thus simplified or complicated, (opinions may differ on the subject) by compressing the three known continents within the circumference of the circular figure thus drawn. This had to be done by cutting short Asia to the east, and by making Africa a very shallow affair along the south side of the Mediterranean. Moreover outlying peninsulas with tiresome projections, such as Scandinavia or India, had to be bent down inward, and extraneous islands such as Britain, Ireland, or Ceylon to be rammed in close to the nearest continent, to the sad distortion of their actual shape.

The conclusions of this class of geographer may be realized by the study of the famous Hereford *Mappa Mundi* (page 5), a picturesque thirteenth century production, which first attracts the spectator's eye by the large vermilion streak across it very properly accentuating the aspect of the Red Sea. This round world was drawn after the Crusades—and shows names

which would have been unknown to an artist of the generation before Godfrey of Bouillon, but nevertheless Asia has had to be made very small, in order that the distance from Jerusalem to India may be no more than the distance from Jerusalem to Lisbon.

The most pestilent habit of the geographer of the Middle Ages was to fill up the unknown edges of the world with pictures of monsters or strange semi-human beings, supposed there to dwell. Some of them go back to Herodotus—who was of course unknown to the medievalist—but many of his travellers' tales were passed on by Solinus (a third-century collector of oddities) along with strange additions of his own. So to the one-eyed Arimaspi and the Amazons are added Satyrs, Gryphons, dog-headed folk, one-footed races who must always proceed by hopping, unicorns, and dragons in wild abundance. They are habitually inserted by map-makers in the remote regions of Africa and Asia, forming a sort of pictorial edging to the better-known regions. In a later century the pseudo-explorer who misused the name of Sir John Maundeville, a non-existent person, recapitulated them all.

Voyages of the Vikings. There was one remote end of the Earth in which exploration was reaching lands unknown even to Ptolemy and the Romans of the Imperial period. But it was carried out in such a way that the rumours of it took centuries to penetrate to the map-makers of central Europe. This was the work of the Scandinavian Vikings, whose daring voyages took them over the north-western seas which classical tradition had reported impassable. Setting aside their less laudable enterprises in England, Ireland, France, and the Scottish Isles, it must be remembered that they settled in Iceland as early as 867, and established a flourishing colony there, which became the base from which the outlaw Eric the Red pushed on westward to Greenland (982).

Restless spirits, often exiles from Norwegian civil strife, settled down in all these remote regions, and pushed farther and farther into the unknown. From the Greenland colony, which seems to have found a climate less uninviting than that of recent centuries, explorers pushed downward along coasts which grew less bare and dismal as they drew ever southward, till they reached "Vinland the Good," a well-wooded land somewhere in the latitude of New England as it would seem. This venture was the work of Leif Erikson (1001) and ended in the establishment of a

short-lived settlement—the first lodgment of Europeans in America—which ended in failure, owing to the hostility of the native tribes. The harassed survivors had to withdraw to Greenland after a few years. So ended an abortive discovery of the North American continent, which might have had incalculable consequences, if the push had been more vigorous and the touch had been continuous. But vaguely reported further attempts at the rediscovery and exploitation of Vinland were ineffective. Even the Greenland colony died out of inanition in the end.

Looking down the ages it is distressing to find that a settlement which in the thirteenth century had a bishop, some scores of parishes, a couple of hundred farms, and a population of at least 5000 or 6000 souls, had entirely perished just before the great age of maritime exploration conquered the north-western seas. This was partly the result of the general blight which seems to have swept all over the Scandinavian kingdoms in the days of the domination of the Hanse League, but, as it would seem, also due to the physical degeneracy of settlers marooned in an inhospitable region, and not recruited from the motherland, owing to the

progressive deterioration of the climate and the falling off of commercial activity. The regular visits of royal Norwegian ships seem to have ceased after 1267, when already it was reported that the occupied area was shrinking, and that the outlying farms were being harassed by "Skraelings"—apparently Eskimos. The last certain evidence of an Icelandic visit to Greenland falls in 1406; by 1448 a papal letter of Nicholas V states that it was thirty years since the few surviving settlers had seen a priest or heard a mass. Before the end of the fifteenth century the colony had perished: recent exploration of the pathetic remnants of its buildings show evidence of an etiolated race dying out of poverty and malnutrition. Undoubtedly a main cause of its extinction was the absence of timber from which ships could be built. The decaying colonists could not even escape by sea when Norwegian vessels ceased to visit them. The memory of the settlement, and of its connection with "Vinland the Good," survived of course in Iceland, where the sagas of the Greenland adventure were familiar. If Christopher Columbus visited Iceland in 1477, as he asserted, it is clear that he must have heard of the fertile lands beyond the western



THE GREENLAND COAST

Here the Vikings established a colony which flourished in the tenth and eleventh centuries. From this base the first lodgment of Europeans in America was made

Photo - Photopress

sea: though they were not the Indies on which his mind was set, they could not be very far from them.

Nestorian Missionaries. In the same ages when the Vikings were pushing their adventures to the unknown north-west, there was another trend of exploration in progress, equally unknown to the generality of men. This was the advance of the Nestorian missionary explorers across central Asia, from Armenia and Persia to China itself.

The details of it are obscure; it is only

occasionally that we come across a note like that which tells how Nestorian monks brought the first silkworms' eggs to the Court of Justinian. Unfortunately the Nestorian church was always regarded as heretical both by Rome and by Constantinople, and its patriarchs at Ctesiphon, and afterwards at Bagdad, were heresiarchs, whose activities were viewed with disapproval, and received little notice. Nevertheless the chain of Nestorian mission-churches extended from Bagdad to Malabar, Samarkand, and Singanfu in the ninth century, and survivals



THE IDEAS OF THE FIFTEENTH CENTURY COMPARED WITH MODERN KNOWLEDGE

It will be seen that in the above map the Americas and revised outlines of western Europe and Africa have been superimposed by the cartographer Kiespert on a globe made by Martin Behaim in 1492. Behaim knew nothing of the Americas or the Pacific Ocean, and thought that only Cipango, the I. des S. Brandam, and numerous small islands lay between Europe and India.

Courtesy British Museum

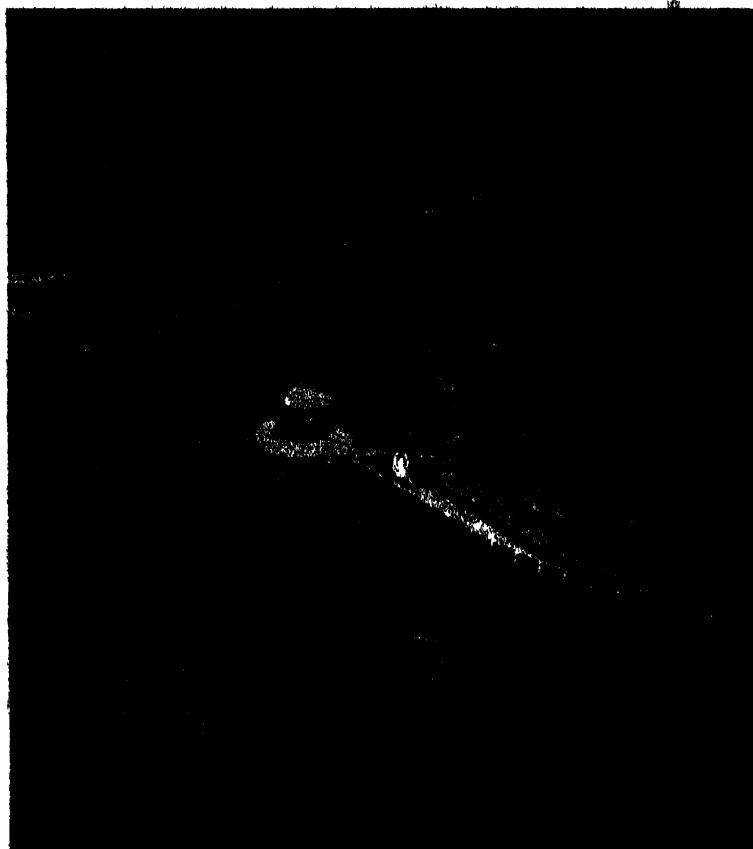
of their community were found in China by Marco Polo, when he travelled in those lands 400 years later. The urge of the Nestorians, like that of the Franciscans in a later age, was missionary and not mercantile, but its record never penetrated to the west, as did that of the Friars in the thirteenth century.

Arab Ventures in Asia. During these same dark centuries another series of explorations, equally unknown to the peoples of western Europe, were being carried out by the Arab conquerors of the early Caliphate. Raids of conquest in Asia and mercantile enterprise in the Indian Ocean both went far afield. But little knowledge of what the Moslem armies found in the Punjab or Turkestan, or of what traders starting from Suez or Bussora discovered in the coasts of Zanzibar and Mozambique, or in the East Indian Islands that were passed on the way to China, ever reached the west.

What did penetrate to the learned men of Christendom were unfortunately the perverse

guesses of Arab geographers, who were often, in their own fashion, as wild as Cosmas or any other Christian maltreater of the Universe. It was from them that Albertus Magnus and Roger Bacon heard of the Arim or central mountain of the world, from which all geographical calculations should be made, because it is equidistant from the two Poles. But to the Arab the west and the north were equally inaccessible, the one because the Atlantic was a sea of darkness, impassable from its tract of viscous seaweed in which no oar would bite (the Sargasso Sea?), the other because of the "Wall against Gog and Magog," an iron barrier drawn by (of all people!) Alexander the Great, which excluded noxious and hardly human northern races pinned in their perpetual night. (The Great Wall of China?)

The Mediterranean Reopened, and the Crusades. The real urge for the rediscovery of the world by the nations of Europe began not so much with the north-western ventures of the Vikings as with the clearance of the



THE GREAT WALL OF CHINA

The "Wall against Gog and Magog" was attributed by medieval geographers to Alexander the Great

Photo Keystone

Mediterranean for eastward progress in the second half of the eleventh century. When the Genoese and the Pisans drove the intrusive Moorish pirates out of Corsica and Sardinia (1052) and the Norman Roger of Hauteville subdued the Emirs of Sicily (1061-88), the waterway to the Levant was cleared, and the Crusades became possible. For it must always be remembered that though the earliest crusaders marched by land, the maintenance of the Latin Kingdom of Jerusalem and the other crusading states was only practicable because the sea had become open once more, as it had not been since the seventh century.

Hence the rush to the East, not only of pilgrims, who could now revisit the lost shrines of Palestine, but of merchants—mainly Italian—who could get into direct touch with the riches of the East. For the crusading states became the bases for widespread commercial enterprise—Frank and Saracen were not always at war, and the Venetian and Genoese broke up the monopoly which

Constantinople had long enjoyed. The Italian seafarers, when the wicked "Fourth Crusade" of 1204 had smashed the Byzantine Empire, usurped all the trade of the Levant, the Black Sea, and the eastward caravan routes. Moreover, we find long voyages from the Atlantic to the inner sea such as that of the Norse King Sigurd "the Jerusalem-farer," who sailed from Oslo to Acre in 1107-1109, not without some incidental fighting on the way. And in 1189 the fleet of Richard I went round from the English Channel through the straits of Gibraltar, though the king himself journeyed from his Gascon possessions overland to Marseilles, and was only picked up by his ships at Messina.

Influence of the Mongol Empire. The mastery of the Mediterranean by the "Franks," and the reopening of the old trade-routes eastward, had incalculable results on the knowledge of the world in western Europe. Though some cloistered geographers continued to draw maps of the Jerusalem-centred round world far into the thirteenth century, and to repeat all the old legends of Solinus, the practical men were at work restoring the habitable world to the dimensions which it had covered in the days of Ptolemy. This extension was favoured to an enormous extent by a political chance. The East had never really got into possible touch with the West

since the Chinese armies had been on the Caspian in the second century A.D. But in the early thirteenth century a militant empire arose, which overran all the lands from China to the Danube, and whose armies penetrated not only to Russia, but even into Poland and Hungary (1224-42). While the Mongol Empire of Genghis Khan and his family was in existence, there was a single power whose domination reached from the Black Sea to "Cathay."

And when the first terror at the approach of the Mongols had passed away, and their advance had halted, the Western peoples found that it was possible to deal with them. A passport of the Great Khan, picked up on the Black Sea from the local governor, would carry an envoy, a missionary, or a merchant to Karakorum and Cathay and the Yellow Sea. All the vast stretch of journeying was made under one authority. There was a time when the Popes thought that this awful power might be enlisted as an enemy of the Saracen; even that the Mongols, still heathens, might be converted to Christianity. Hence missions, partly political, partly missionary, to the court of the Great Khan starting as early as 1245-6.

Two records of two envoys who penetrated to the heart of the Mongol Empire, Giovanni da Plan Carpini (1246-47) and William of Rubruquis (1252-55), sufficed to give the



GREAT EXPLORERS

Left Sir Walter Raleigh though Queen Elizabeth limited his personal ventures he dispatched several exploring expeditions and is credited with the introduction of tobacco into Europe. *Centre* Captain James Cook surveyed the Saint Lawrence River and Newfoundland coast, discovered Australia, killed by natives of the Sandwich (Hawaiian) Islands. *Right* Sir Francis Drake: adventurer, finest exponent of seamanship in his time, circumnavigator of the world

Photos British Museum, National Portrait Gallery



AFTER THE VOYAGES OF COLUMBUS
A part of the Typus Cosmographicus Universalis made in 1502
Courtesy British Museum

western world a new conception of Asia—no longer the shrunken continent of the Dark Ages, but a vast mass of lands, civilized and uncivilized, such as had never been comprehended by earlier geographers. Genghis Khan was dead (1227) but his empire still held together under his successors for many years, and as long as it lasted ingress and travel was possible. The idea of converting the Mongols to Christianity gradually petered out. Its only results were some isolated conversions of doubtful worth—from whence, oddly enough, the legend of “Prester John,” a powerful Christian monarch sequestered in the remote east, became popular in Europe. But the Mongol emperors, though they tolerated Nestorians, who still survived in their realm, and treated western missionaries with a limited courtesy, kept to their own superstition, till in the fourteenth century their eastern hordes were absorbed into Buddhism, and their western section turned Mohammedan. Meanwhile so long as the Mongol Empire held together the “Franks” were allowed free passage, and sometimes were taken into the imperial service. Ephemeral bishoprics continued to be created and to disappear in central Asia and China, for several generations, and the mercantile enterprise of the Italian adventurers flourished for many years.

Marco Polo was actually made an official of the great Kublai Khan, and not only administered Chinese provinces in his name, but was once entrusted with the delicate task of conveying by sea from China to Ormuz a Mongol princess, the destined bride of Kublai's nephew Arghun, sub-King of Persia. The voyage round the Straits of Malacca gave him the opportunity of learning about the Spice Islands near Java, of landing for a space in Sumatra when wind-bound, and of catching a glimpse of the decadent Christian churches—Nestorian unfortunately—of southern India (1292–1294).

In short, the western travellers had pushed back the boundaries of the “habitable world” just to where they had been left by Ptolemy twelve hundred years before. We may even add that they had made some small addition to his map—for the Vikings had brought Iceland, Greenland and the White Sea into the picture—and at the other end of the line Marco Polo had heard of—though he had not visited—Japan.

The thirteenth century saw the commencement of the use of the Mariner's Compass,

whose most primitive form had been known to the Chinese. It is mentioned by Alexander Neekam, a contemporary of Richard *Cœur de Lion*, and spoken of as a necessary help for sailors by several writers of the next generations. This was an epoch-making invention for those who dared to push out far from land into unknown seas.

The Mamelukes and Ottoman Turks. There came in the fourteenth century a check to eastern enterprise. The first bad blow was the destruction of Acre, the last surviving Christian port in Palestine, and the base of all caravan trade with Syria and the lands behind it (1291). The Mongol Empire broke up, and no longer could the golden-tablet passport of the Great Khan pass a traveller from Azov to Pekin. Five Khanates—often hostile to each other—now stood across the route. In 1360 the native Chinese Ming dynasty drove out the Mongols from China. In 1336 the last descendant of Genghis lost Persia. From 1380 onward the adventurer Tamerlane (Timour) devastated all the old Mongol realms from Samarkand to the Euphrates, and left ruin behind him.

But the deadliest blow was to be dealt by the Ottoman Turks, who, after descending into Europe in 1355 and occupying the greater part of the Balkan Peninsula, captured Constantinople in 1453, and cut all the trade routes which the Venetians and Genoese had been holding in the Black Sea, making an end of the last but one of the lines by which western Europe had been keeping up a precarious touch with central Asia.

The last route of all surviving was that by which the Italian mercantile powers could trade at second-hand with the Indies, by their alliance with the Mameluke Sultans of Egypt. These acted as universal middlemen, receiving the goods of India and the remoter lands lying east of Suez, and transferring them to Alexandria, where the Venetians picked them up, and distributed them to all southern Europe. In the fourteenth and fifteenth centuries Alexandria was the greatest port in the world, and the Mameluke Sultans the wealthiest of monarchs, from the exorbitant transit duties which they extorted. All this came to an end when in 1517 the Ottoman Sultan Selim destroyed the Mameluke Sultanate, occupied both Syria and Egypt, and shut the harbour of Alexandria to the Italians. It looked at Venice as if ruin to Christian commerce had supervened.¹



JACQUES CARTIER LANDS IN CANADA

Cartier sailed westward in 1534 to take possession of all lands he might find for King Francis I of France. He discovered the Saint Lawrence River and sailed up it to the point where Montreal now stands. (From the painting)

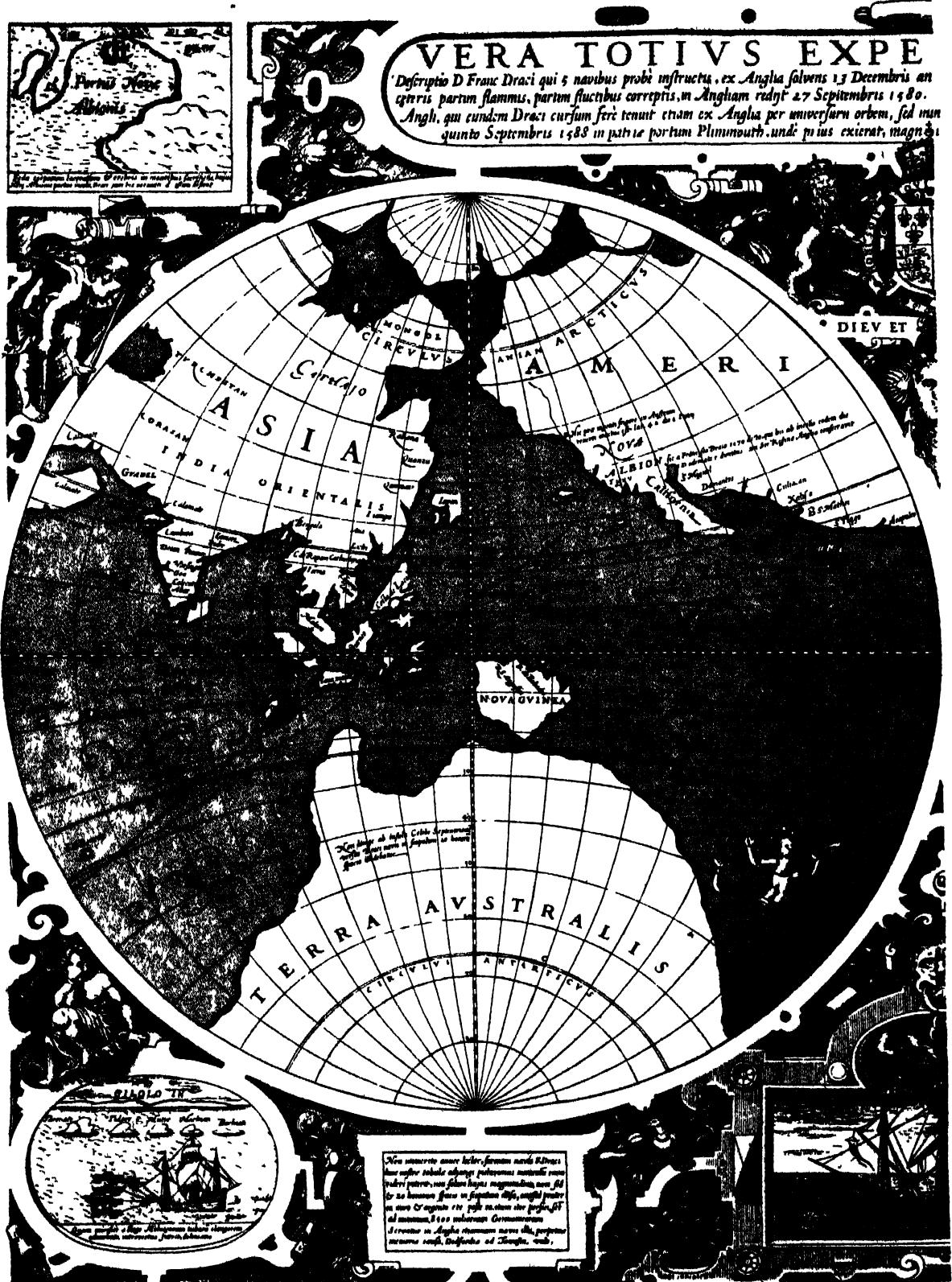
Photo Wide World

The All-sea Route to Spice and Silk. That this was not the case, and that a new route to the Indies had been opened just in time, only twenty-five years before the last of the old ones was shut, is one of the crucial points both in the history of exploration and in that of trade. And the astounding thing is that the discovery of the all-sea route to the lands of spice and silk exactly synchronized with another and still more important discovery—that of the Americas. This discovery, oddly enough, was a by-result of that same urge for finding a new route to the Indies which sent Vasco da Gama round the Cape of Good Hope. For Christopher Columbus, when he hit upon Cuba, laboured under the vain impression that he was getting to the immediate neighbourhood of Japan.

The marvellous discoveries which in the forty years between 1392 and 1432 doubled the size of the known world, and made an end of medieval geography, were the sudden result

of long and rather ineffective gropings in that Atlantic Ocean which the Arabs (and other seekers before them) had reckoned as a black and impenetrable waste of water, the end of the Earth, perhaps the edge of another world. Here Irish heathen legends had placed the land of immortality, and later Irish Christian legends had invented the miraculous isles of St. Brandan, where he had found not only the Earthly Paradise but visible angels and Judas Iscariot afloat on the iceberg! The isles of St. Brandan continued to be marked on the maps of idealizing cartographers for many centuries.

Discoveries of the Seamen. More prosaic seagoing brought in the late fourteenth century notice of real islands—Lopez driven out of his course by storms found the Canaries (1382), which a French adventurer, Jean de Bethencourt, made a vow to settle after subduing the inhabitants (1402). Madeira, somewhat nearer to Europe, seems to have been known



A map drawn by the geographer Hondius early in the seventeenth century showing the routes taken by Francis Drake, (1577-1580) and knowledge in the seventeenth century of the shape of the continents.

THE VOYAGE OF

Captain

DITIONIS NAVTICÆ

anno 1577. terrarum orbis ambitum circumnavigans, unica tantum navi, ingens cum gloria.
ADDITA est etiam viva delineatio navigationis Thome Caundish nobilis
ori danno & tempore spacio: viagismo primo enim tali & 186 navem confundit. & decimo
et divitijs & cum omnium admiratione reversus est.
Iudocus Hondius.



SHAKESPEARE AND CAVENDISH

by Thomas Cavendish (1585-1588) in their attempts to circumnavigate the World. It also gives an interesting insight into the increasing

It will be noticed that the belief in an Antarctic continent persisted

British Museum



RUINS OF THE SULTAN'S PALACE AT ZANZIBAR

The island was discovered by traders from Suez

Photo Topical

somewhat earlier, though the story of its discovery by an Englishman named Machin in 1370 is very dubious. Yet the Azores, much farther out in the Atlantic, appear in maps of 1350—whether discovered by Portuguese or by Italians is not certain. But all these islands, though some of them are beautiful enough, were trifles compared with what Atlantic voyagers had hoped to find, and the way down the barren coast of Africa stopped for many years at Cape No (Cabo de Nao), which the Portuguese declared to be impassable, and afterwards at Cape Bojador for nearly a century, till 1434.

Henry the Navigator. That these casual excursions into the unknown were turned into steps towards a definite goal, was due to that far-sighted prince, Henry the Navigator (1394–1460), son of John I of Portugal and Philippa of Lancaster, who spent forty years in urging on African exploration from his observatory at Sagres and his port of Lagos. He had been stirred at first by the reports that came through the Moors of the riches of the Gold Coast: but when that had been reached there can be no doubt that the idea of the circumnavigation of Africa, as a way towards the Indies, had come to him. He had heard of Marco Polo's account of the Indian Ocean, and of Arab trade down the east coast of Africa, and was, like everyone else, unaware of Africa's southern extension past the Bight of Benin. If that continent was comparatively narrow from north to south, it might be possible to get round it into eastern waters—as King Juba had declared fourteen hundred years before. And Ptolemy's idea that the Indian Ocean was an enclosed sea, barred out from the Atlantic by a mythical Australian or Antarctic continent, was incredible.

Hence the school of bold sea-captains, reared

by Henry the Navigator, pushed on from Cape Bojador to the Gambia (1445) to Sierra Leone (1471) and long after their patron's death to Angola (1478), till Bartholomew Diaz rounded the Cape of Good Hope in 1486, and brought back the news that the African flank had been turned, and that the Indian Ocean was open, as Prince Henry had foreseen. Only twelve years later Vasco da Gama was to coast up from Mozambique to Mombasa, and run across from Mombasa to Calicut on the Malabar coast of India, where he opened up a roaring trade in all the products of the farther East. "This is the worst news that we have ever received," wrote the Venetian diarist Priuli, who saw at once that an all-sea route to India would bring about the end of the Venetian monopoly of the Alexandria-Suez "overland route."

But Priuli could not know that the voyage of da Gama was to be the salvation of European commerce, after the Turks blocked Alexandria in 1517; and the goods of the East could come in Portuguese bottoms to Lisbon, if they came no longer in Italian bottoms up the Adriatic. Of the astounding expansion of Portuguese armed factories as well as commerce to Ceylon (1506), to Ormuz (1507), to Malacca (1509), and to Goa (1510), it is unnecessary to speak. The Arab traders of the Indian Ocean were swept away by force, and its waters became a Portuguese preserve for eighty years. By 1530 the East had been unveiled, and ships could trade to Macao in China, or to Amboina in the Spice Islands.



THE CAPE OF GOOD HOPE

First rounded in 1486 by Bartholomew Diaz

Photo: South African Railways



ISLANDERS OF THE PHILIPPINE ARCHIPELAGO

In 1521 Magellan sailed through the stormy strait at the extreme end of South America, where his name survives, and continued across the Pacific to die obscurely on a native lance in the Philippine Archipelago. His lieutenant brought home his ship and so recorded the first circumnavigation of the globe.

Photo Wide World

Voyages of Columbus. This was a marvellous expansion of the known world—but a still more marvellous, if not wholly understood, expansion had begun westward, just six years before Vasco da Gama came to Calicut. Moved by the same idea of the open sea-route to the Indies, Christopher Columbus had in 1492 made his first Atlantic voyage, and hit upon the Bahamas, Cuba, and Hispaniola (Santo-Domingo-Haiti), which he imagined to be islands somewhere in the direction of Japan. The ground-notion of this happy error was a miscalculation of the size of the round world. The breadth of its surface from China to Europe was wholly underestimated, and the Azores were believed to be half-way to Japan; the immense stretch of water in the North Atlantic, of land in North America, and of water again in the Pacific being undervalued. The circumference of the Earth had been miscalculated by at least one fifth, and the eastward extension of the Asiatic continent much exaggerated. If Columbus was really in Iceland about 1477, his notions must have been influenced by the knowledge that Iceland was not very remote from Greenland, and Greenland again within possible touch of "Vinland the Good"—which might be

conceived as some eastern extension of the Asiatic Continent.

Be this as it may, when Columbus made his four voyages from Spain and the Canaries, and hit first upon the West India islands (1492), and then on the American continent from Venezuela (1498) to Honduras (1502), he still believed that he had reached some unexpected extension of the eastern side of the Old World. It was left to his successors to find that unbroken land extended from the Arctic Circle to far below the Tropic of Capricorn, and that none of it was Asiatic, but all a new continent. A swarm of seafarers, Spanish and Portuguese in the main, but occasionally English and French, sought up and down this long break-water for the passage to the Chinese seas. They failed to find it, till Magellan in 1521 got through the stormy strait at the extreme end of South America, where his name survives, and sailed across the boundless Pacific (wrongly so called!) to die obscurely by a native lance in a fray in the Philippine Archipelago. But his ship, the *Victoria*, came home, in charge of his Lieutenant, Sebastian d'Elcano, safely rounding the Cape of Good Hope, and bringing the record of the first circumnavigation of the Globe (1522).

Seeking Northern Passages. This was in its way a more important achievement of exploration than Columbus's discovery of the West Indies, since it demonstrated that the world could be sailed round, that there was a water-passage, though a hard one, between the Atlantic and the Pacific, and that clearer estimates of the size of the terrestrial ball must be made. For the future, exploration meant only the filling up of the large vacant spaces on the map. Unexpected rewards sometimes awaited the Conquistadores—as when Cortez found and conquered the wealthy realm of Mexico (1519), and Pizarro the equally rich and less savage empire of the Incas of Peru (1533). On the other hand many an expedition perished obscurely in seeking other similar gains. The fabulous "El Dorado," fabled to be a second Peru, lured voyagers even in the seventeenth century—the last and most famous of them, the Englishman, Walter Raleigh (1616). And in much later days many a seaman perished in the attempt to discover the "North-West Passage" to the Indies, round the Arctic shores of North America, or the equally perilous "North-East Passage" to the same goal along the northern shore of Siberia. Both routes exist on the map, but both were impracticable to sailing ships, and remained death-traps, as Hudson, Barents and Sir John Franklin found.

Filling Spaces on the Map. After Magellan, discovery merely meant filling up the large white spots on what Shakespeare called "the new map with the augmentation of the Indies." There were plenty of them to busy the explorers of four centuries—the most enormous was the far south, where it was long thought that a vast Antarctic continent existed,

of which Australia and Tierra del Fuego were projecting points. Two Dutchmen exploded this myth—one who rounded Cape Horn in 1616, and saw illimitable sea to the south: another, Tasman, cut round the south coast of Australia in 1642, and found equally illimitable sea toward the Antarctic circle. The frozen land round the South Pole is a dreary and unprofitable affair—smaller and even less profitable than the ice-bound isles about the North Pole. Both continue to exercise a rather incomprehensible attraction for the human mind. The clearing away of other white patches on the map—in the centre of Africa or North and South America, or the island-strewn waters of the North Pacific—was interesting work enough—but it does not bear comparison with the work of Columbus or Magellan—who doubled the size of the habitable world.

In the Middle Ages anything was still conceivable for the adventurous explorer. He might run upon the Earthly Paradise, or the "Fountain of Youth" which the apocryphal Sir John Maundeville claimed to have tasted, or the lands of the Roc and the Gryphon. All this was gone by 1600, even the foundation of all misconception, the geocentric Universe with its obliging Sun and Moon and planets, so dear to astrologers. Copernicus had shaken up the oldest of all old conceptions, and the world was on the spin in a heliocentric system, though the followers of Copernicus had much trouble with the Church. But as Galileo said, "*e pure se muove.*" And the rotating earth-ball had lost much of its mysteries—especially the preternatural ones so dear to the medieval map-maker.



DOUBLE BAY, SYDNEY
The first White settlers in Australia landed in 1788 on the coast where now stands Sydney. To-day Sydney "an important trading centre, the earning house for almost half of Australia's trade, and next to Melbourne, the most important British commercial centre in the Southern Hemisphere." Photo: *High Committee over for Australia*

(G 100)

MODERN MAPS

THE most important instrument of the geographer is the map. It enables him to summarize his knowledge, to place before his eye all the geographical facts known about a given area, to recognize the details of topography and of human occupation, and to have a convenient guide through the district.

It is hard for people who live in a country long settled and completely mapped to realize the difficulties which confront those who found themselves citizens of a new and unmapped country. The need of maps appears most urgently in case of war, but in peace-time, too, the needs are great and numerous: until a country is mapped it is impossible to devise any well-considered schemes of communication; until it is surveyed on a fairly large scale it is impossible to make grants of land to settlers. In larger affairs, until a country is mapped it is impossible to agree upon mutually convenient boundaries. It is the truest economy to push forward the survey of a country at the earliest possible moment.

A map is a proportionately reduced representation of the whole or a part of the Earth's surface projected on to a plane. The amount of information which can be compressed into a map depends firstly on the perfection of the system of conventional signs used and secondly upon the size of the map in comparison with the ground which it represents, in other words the scale. The larger the scale, the more detailed is the information which can be given. But, on the other hand, the larger the scale, the greater is the number of sheets required to cover a given area and the more cumbrous is the map to use.

Maps may be classed into three principal divisions—

Cadastral maps, on large scales, show boundaries of property and individual buildings.

Topographical maps show the natural features of the country, hills and rivers, forests and swamps, and also such features as man has added to the country in the shape of towns, roads, railways, canals and bridges.

Atlas maps are on scales still smaller. Most

of the topographical details have been suppressed; only the chief ranges of hills, the main streams of rivers, and the most important towns can be represented.!

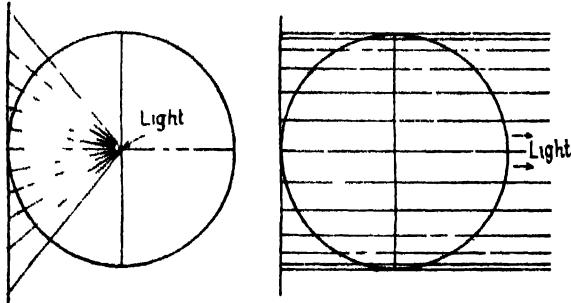
Scale. The scale of a map is of prime importance. In Great Britain the official scales of the Ordnance Survey are of $25, 6, 2\frac{1}{2}, 1, \frac{1}{2}$, and $\frac{1}{4}$ inch to one mile, 10 miles to one inch, and 1 in 1,000,000. This last is given in the "representative fraction," or the ratio of the distance on the map to the distance on the ground. Thus the R.F. of the one-inch-to-the-mile map is 1 : 63,360 (there are 63,360 inches in a mile). In countries where the metric system is used, the R.F. will be in round numbers: the one-in-a-million map mentioned above is an international map.

The scale of a map is shown on a diagram which enables one to translate distances on the map into distances on the ground, and it should be so constructed that any length taken from the map with a pair of dividers can be read off from the scale. The straight line joining two points on a map, however, is not necessarily the shortest route from one to the other on the ground, owing to the curvature of the earth's surface, so that in maps of large areas, such as atlas maps, there can be no such thing as an accurate scale of distances.

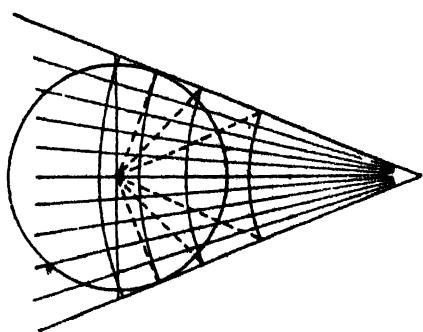
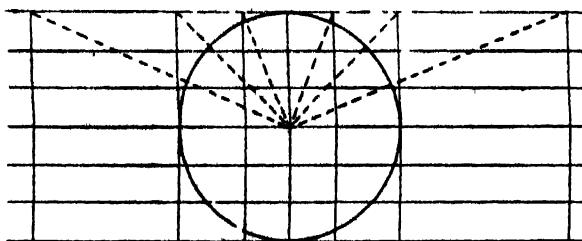
Projections. It is obvious that it is impossible to represent a spherical surface such as that of the earth on a plane in such a way as to preserve (1) equality of area throughout, (2) the correct shape of a given feature, known as orthomorphism, (3) the correct scale, and (4) the correct bearing. A map projection is a means of representing the lines of latitude and longitude of the globe on a flat sheet of paper.

There are many different kinds of projection: in some the lines of latitude and longitude are straight, in others curved, and, yet again, the meridians may be straight and the parallels curved or vice versa. In order that a map (after reduction is made for scale) may be equal in area with that part of the globe which it represents, the shape must be distorted. A

combination of true shape and area is impossible. It is also impossible to have the scale correct in all parts of the map. At any one point the scale can be the same in all directions, though it will vary from point to point.



Left Principle of Gnomonic Projection The light is placed in the centre of the earth. The rays passing through parallels of latitude place them farther and farther apart on the plane of projection until those passing through the poles move parallel to the plane and could never meet it.
Right Principle of Orthographic Projection The light is placed at infinity, so that the rays are parallel. As the Poles are approached distances are rapidly foreshortened



Above Principle of Cylindrical Projection The light is placed at the centre of the earth. The rays increase the space between parallels towards the Poles. *Below Principle of Conical Projection* The light is at the centre of the Earth. The parallels become curves, the meridians straight lines focusing on a point off the map. Distortion increases with distance from the tangent parallel

The preservation of correct bearings, or azimuths, is important in maps which are used for navigation.

Projections made on to a plane tangent to one particular spot on the globe are known as Zenithal or Azimuthal projections. In Conical projections a sheet of paper may be imagined rolled up to form a cone which may be placed on a globe of convenient size. If the apex of the

cone lies on the axis of the earth produced, the cone will rest along a line of latitude (the one-in-a-million map is constructed on a modified form of the Polyconic Projection).

A third system of projections is known as Cylindrical projections. In these a sheet of paper may be imagined rolled into the form of a tube and placed around the globe. This system is frequently used in atlases, the best known projection of this class being Mercator's projection.

Apart from these, there is a useful class of projections which may be called Conventional projections. They vary a good deal both in construction and in appearance. Mollweide's projection occurs in most atlases for world distribution and is in the form of an ellipse.

Conventional Signs. In order to compress as much information as possible into the minimum space, and to ensure clearness, it is necessary to adopt a carefully considered scheme of conventions, so that the character of every line and the style of every letter may convey a definite meaning.

The "characteristic sheet" is the key to the system of conventional signs employed on a map and the "reference" is a small characteristic sheet of the principal conventional signs; it should also include the vertical interval of the contours and similar information, together with the date of the survey and its revisions and date of publication. Each sheet of a series should show the names or numbers of the adjacent sheets.

One of the most important features to be indicated on a map is relief. The relief of the ground, which used to be shown by hill-shading and hachures, is now represented by contours, spot heights and hypsometric tints known as the "layer system." Recent improvements in the process of colour printing have made it possible to produce maps sometimes with as many as twelve or fifteen separate printings.

A contour is a line joining a series of points which are all at the same height above mean sea level. They may be considered as the standard method of showing relief. They should be drawn at uniform intervals of height in order to obtain a clear impression of the relief of the country. The vertical interval between contours is usually 50 or 100 feet, 10 or 20 metres. The contours are numbered, the figures standing on the upper side of the contours. When the country is steep, the contours come close together and the eye can

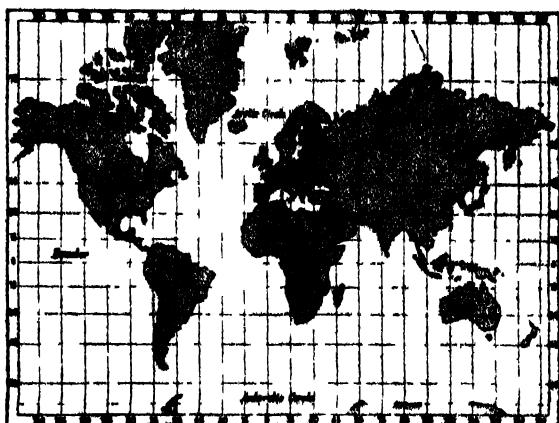
be guided by accentuating every tenth or fifth contour.

The aim of layer colouring is to give the map an effect of relief which contours alone cannot give. A scale of gently graded tints is chosen, and all the ground which lies between two certain contours is coloured one tint, while that included between the next pair of contours is coloured the next tint in the scale. The colours proceed from green at sea level towards brown shades at the higher altitudes.

While contours are generally either brown or red, rivers and streams are always shown in blue. There are special signs for locks, weirs and falls, and an indication is given of the navigability of rivers. A distinction is made between natural streams and artificial canals. In general a stream will cut a contour at right angles to its general direction, the contour being thrown back upstream where it crosses. When the fall of the stream is rapid, the contours are V-shaped at the crossing; when the ground is flat, the contours are more rounded.

Woods and forests are often shown by small tree signs, sometimes of two varieties to distinguish between deciduous trees and conifers. When forests are coloured green, this interferes with layer colouring, while the small tree signs are apt to obscure other details.

Roads are not represented to true scale in width, but the width is conventional, signifying the class of road. A distinction is made between fenced and unfenced roads, and grades of metalled roads are distinguished by difference in width, the first two grades being coloured, generally red or yellow.



THE WORLD IN MERCATOR'S PROJECTION

Railways are almost universally shown in black, with a distinction between double or multiple and single tracks and narrow gauge railways.

The importance of a town may be indicated either by the size of the sign which denotes its place, or by the size and type of lettering which gives its name. Generally the administrative importance should be shown by the sign and the number of inhabitants by the size of the name, though there are many exceptions to this rule.

The sheet margins of a map should be divided into latitude and longitude and the margins of contiguous sheets should overlap to some extent. The margins should also be divided into sections of some convenient unit of length and each section should bear a letter or number to provide a ready means of referring to a particular region of the map.

The Grid System. A cartographic development of the 1914-18 war was the use of the "grid" system for defining the position of points on a map; this grid system was made continuous over the whole country. A grid is a series of lines drawn parallel and at right angles to the central meridian of the projection used, thus forming a series of squares. The Davidson Committee, set up in 1935 to consider Ordnance Survey maps of Great Britain, recommended the replacement of the previous yard grid by the use of the international metre as the basic unit for grids.

The intervals between grid lines depend on the scale of the map: on the quarter-inch map, for example, the lines are at 10 km. intervals, while on the one-inch map the interval is 1 km. These grid lines enable one to obtain co-ordinates of any point on the map with



CONTINENT OF EUROPE ON BONNE'S PROJECTION

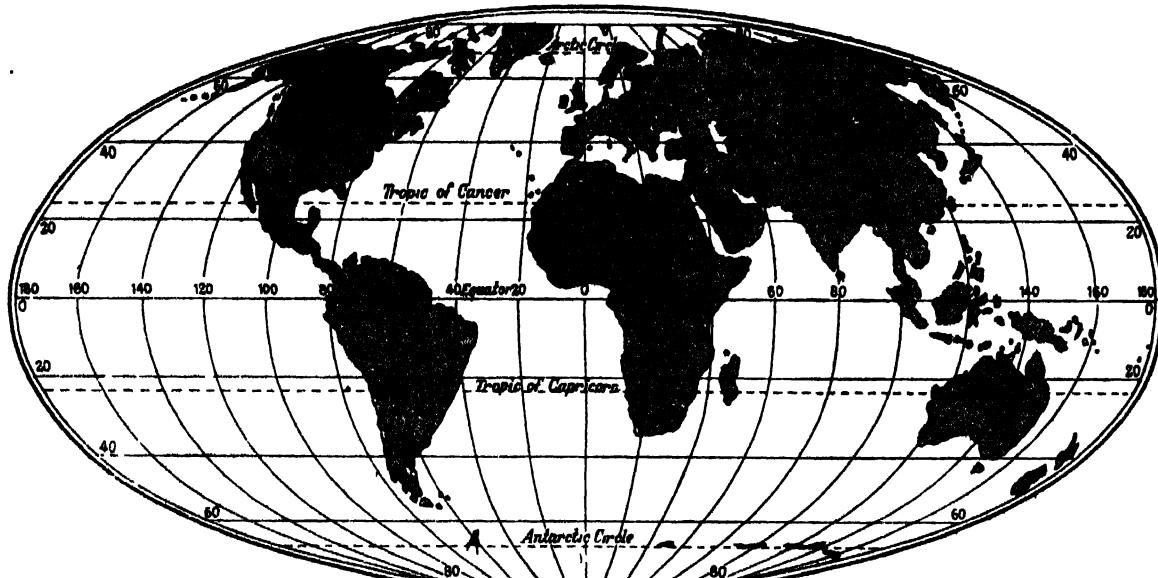
an accuracy appropriate to the scale of the map.

The system of grid references is universal for the whole of Great Britain, though there are two different conventions for writing the abbreviations for large and small scale maps respectively.

The co-ordinates to any point on the map to the nearest metre would have six figures each, representing eastings and northings. The former is always written before the latter. For most purposes it is sufficient to know a position to the nearest 100 metres, so that the

The Full National Grid Reference is to be modified as soon as practicable so that the 100 km. squares will be designated by two letters instead of two figures and an oblique stroke. The system of gridding Ordnance Survey maps of Great Britain for civil use is the same as that used by the armed forces, though there is a slight difference between the two in the methods of giving references. It has been decided that the Ordnance Survey should adopt the military method so as to get uniformity between the two.

Surveying. The simplest and most ancient



THE WORLD ON MOLLWEIDE'S PROJECTION

last two figures, representing the digits and tens of metres, of each six-figure ordinate may be dropped. The general location of a point is usually known to within 100 km., so that the first figures of each ordinate, representing the hundreds of kilometres, may also be dropped. The two sets of three-figures now remaining form the *Normal National Grid Reference*. The position of a point *P* in London, shown in Dia. I opposite, is thus 389,770.

To make this reference unique throughout Great Britain, the figures representing the hundreds of kilometres in each ordinate must again be inserted, however. They are separated from the Normal National Grid Reference by an oblique stroke, thus: 51/389770. This form is known as the *Full National Grid Reference*. The position of the square 51 in the grid is shown in Dia. II.

method of making a map is by direct measurement on the ground by means of a chain or tape. Precise cartography depends on a system of triangulation, the base of the triangle being very carefully measured with invar tape stretched on tripods and held taut by weights. Corrections are made for variations in temperature. The base line is usually limited to a few miles, and as soon as this has been satisfactorily measured the country to be mapped is divided into triangles whose sides are about 50 miles in length and whose apices rest on conspicuous features. Beginning at the base, the angles of these triangles are measured with a theodolite and the dimensions of the triangles are calculated by trigonometry. The result is the primary triangulation of the country.

In the secondary stage, the primary triangles are subdivided until each has been broken down

into a number of smaller triangles whose sides are about one and a half miles long. Triangulation enables the general shape of the area to be determined and fixes a number of points whose positions are known precisely and which can, therefore, be used as a basis for more detailed survey.

The insertion of topographical detail, including coastline, can be accomplished by means of chain or plane-table surveys. In the first method, the secondary triangles are broken down still further into others whose sides vary from a few yards to a quarter of a mile. The sides are measured by means of a surveyor's chain. The measured lines are so arranged as to pass close to minor features which it is desired to show on the map. The positions of these are fixed by offsets, that is, short measurements taken at right angles to the sides of the triangles.

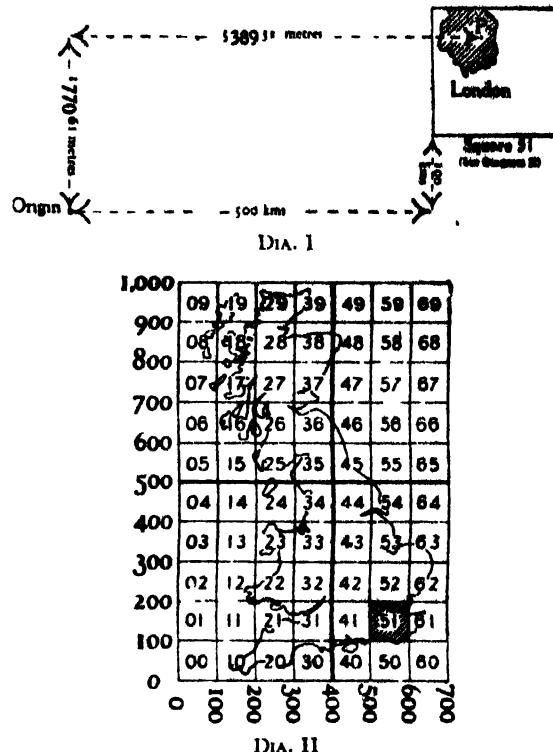
In the plane-table method the surveyor is provided with a portable table whose top can be placed perfectly horizontal. Starting from two known points inserted on a sheet of paper, which is pinned on the table and correctly orientated, the surveyor uses a sight-rule or alidade to draw rays from each of the known points towards the various features which he wishes to record on the map. The point of intersection of two rays drawn towards a given feature marks the position of the feature on the map.

Photographic Surveying. In recent years photographic survey has played an ever-increasing role in map making and is certain to be still more important in the future. A simple method of photographic survey is the "Canadian method," in which the position of the camera station and the bearing of a conspicuous point in the field are determined from preliminary triangulation with the theodolite. The defect of this method is that there are often not many points which can be identified on a pair of photographs without some form of stereo-comparator. When a pair of plates is combined stereoscopically, the identification becomes obvious and as many points as may be required can be plotted without difficulty.

The most recent machines developed for Photostereoscopic Surveying utilize the principle of the photogoniometer, in which the plates are viewed through objectives identical with those which took them. The machines may be divided into two classes: those in which the rays from the photogoniometers are

brought directly into the stereoscope, and those in which they are projected on a screen and the projected images thus viewed. The first kind is probably the more successful.

Contours drawn by these machines in mountainous country have been found to be much more accurate than those made by older methods. It is probable that stereoscopic survey from ground stations will play a considerable part in the future, supplemented by air survey for the "dead ground" which is



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omitted in ground photography, and tied to points already determined by the ground photographs.

Air photographs have the disadvantage that they are taken from points which have to be determined implicitly with the height, bearing and tilt, whereas photographs taken from ground stations fixed trigonometrically start with the advantage that the position of the base is known with great accuracy. The use of radar is a great help in keeping the aeroplane on a perfectly even course. A series of photographs or "strips" is taken along parallel lines of flight, with considerable overlap between each successive photograph. A mosaic is a composite picture obtained by pasting together

a number of overlapping vertical air photographs.

Modern designs in surveying cameras aim at reducing the weight of the instrument and films are substituted for the heavy plates which used to be used. Small cameras such as the Leica can be carried by a gallery upon a special type of theodolite.

Map Reproduction. The old process of cutting a map in high relief backwards on stone has been superseded by process-engraving. In Great Britain, when it became necessary to make a fresh start with the one-

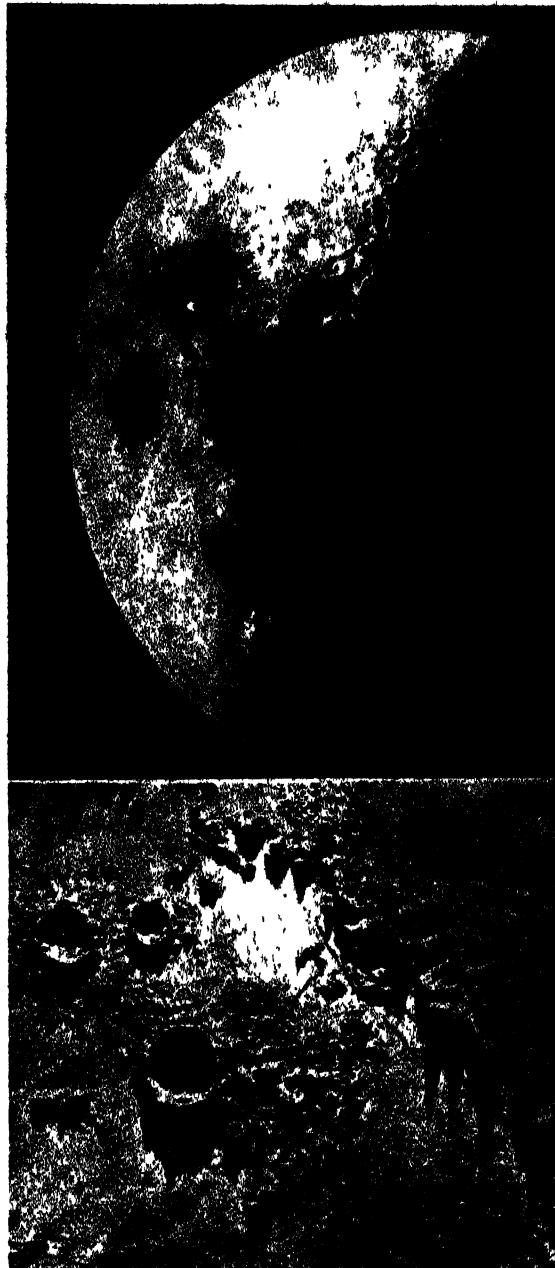
inch map, the new original was drawn on card and the printing plates made by photography. In the modern process of "zincography" a finely grained zinc plate has replaced the stone and the drawing is reproduced either to scale or to a chosen reduction.

Maps were coloured by hand until late in the nineteenth century. Now coloured printing is carried out by "silver prints," colour-films, coloured collotypes, offsets and other photographic methods, although in almost all cases colouring by hand is still necessary at some stage.

THE EARTH IN THE SOLAR SYSTEM

THE worlds that revolve round the Sun differ very widely in their conditions. Mercury, the nearest to the Sun, has such a high temperature that lead would melt under the solar rays, while other regions of its surface experience perpetual night and intense cold. Moreover the planet is practically without air, which absence would suffice to prevent habitability. The next planet is Venus, our nearest neighbour (at least among worlds large enough for possible habitability). Venus appears to be continually veiled by clouds and vapours, which prevent us from knowing much about the conditions on its surface. But observations with the spectroscope suggest that its day is much longer than ours, perhaps two or three weeks of our time, which would imply great loss of heat during the long night. Venus is closely comparable with the Earth in size, so that it is tantalizing to know so little about a world on which we should expect to find conditions resembling terrestrial ones. One notable difference is that Venus has no satellite; though as regards one useful function of our Moon, that of raising tides in our seas, the Sun would be as efficient as a tide-raiser on Venus as the Moon is to us. The air in Venus is much more cloud-laden than our air; this would have the effect of mitigating the heat by day, which would otherwise be very great, and also of acting at night as a blanket to prevent the rapid escape of heat.

An important point, in considering the habitability of worlds, is the angle at which the axis about which they spin is inclined to the level in which they travel round the Sun. Two planets, Mercury and Jupiter, have their axes practically upright, which would mean an absence of seasonal changes. The same is true of the Moon; but as none of these three worlds is likely to be the scene of animal or vegetable life, the point is not of much importance for them. The tilt in the case of the Earth is "Twice ten degrees and more" as Milton expresses it; a tilt which gives rise to well-marked seasons, but not violent extremes, except in some regions, such as Siberia. Three planets, Mars, Saturn, and Neptune, have tilts about



THE MOON

Above: The Moon in the first quarter. Below: The surface of the Moon taken with the aid of the 100-inch reflector at the Mount Wilson Observatory, U.S.A. It shows the area in the region of Copernicus. Note the huge peaks (right), the craters, and the fissures, hundreds of miles long, caused by past eruptions

Photos: Keystone; Topical

the same as the Earth's, while Uranus has such an extreme tilt that the Sun would shine nearly vertically over each of its poles alternately for many terrestrial years. Venus is the only planet for which the amount of tilt is unknown, the reason being that a constant veil of clouds hides its solid surface. We have, therefore, to leave this beautiful planet, our morning and evening star, with many questions unanswered, although it is both our nearest neighbour and the one most resembling the Earth in size and in mass.

Why the Earth is Habitable. The Earth is the third planet from the Sun in order of distance. The distance of a planet from the Sun



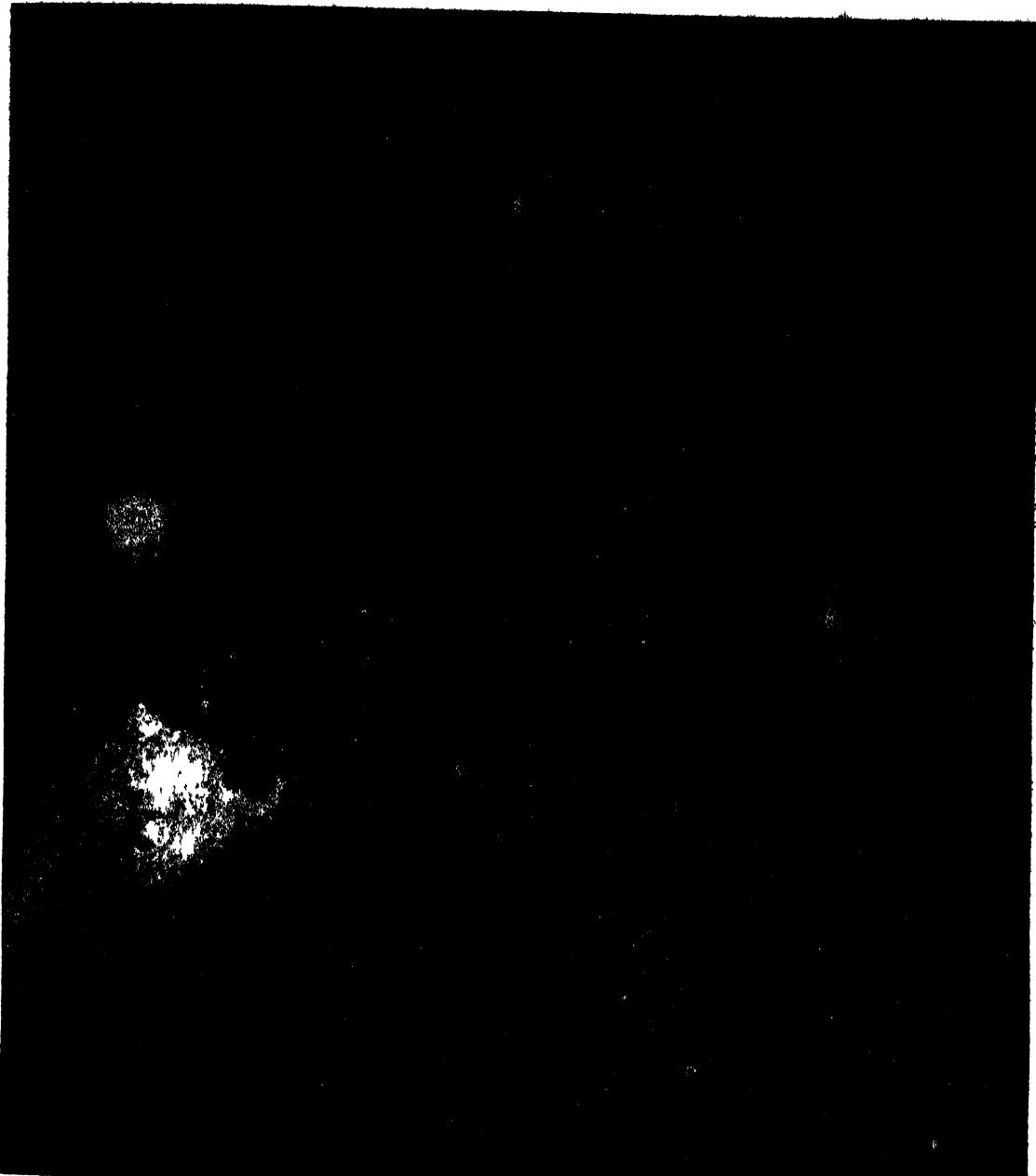
THE PLANET MARS
Photo. Keystone

is an important factor in its fitness for habitability. The greater part of its surface enjoys a climate free from extremes of either heat or cold: the large oceans, by their evaporation, provide clouds that carry water to the land, where it is needed both by plants and animals. Probably the Earth's internal heat plays a part in its habitability, by causing the uplifting of some regions, and preventing the submersion of all the land under the ocean which would otherwise result from continued denudation. The tides, which we owe to the Moon, and in a less degree to the Sun, serve useful purposes in navigation, facilitating the ascent of tidal rivers like the Thames; they also circulate the sea water, and prevent the pollution and staleness to which the waters round inhabited

regions would otherwise be liable. While the supply of clouds is sufficient for the watering of the land, it is not such a dense mantle as to prevent all knowledge of the heavenly bodies. Navigation would be a very difficult art without this knowledge.

The Moon, companion to the Earth, is, like Mercury, a dead barren world, without air or water. Gases, owing to their mobility, are constantly tending to escape, and the force of gravitation is needed to restrain them. Mercury and the Moon have not sufficient mass for this purpose, and whatever air they once had has been dissipated in space. The same is true, but to a less complete extent, with Mars, the planet fourth in distance from the Sun. This evidently has some atmosphere; portions of its surface are occasionally veiled by cloud, and deposits of snow or frost alternately form and melt round its poles. Moreover, the changing tints of the dusky portions of its surface suggest the presence of some forms of vegetation. These dusky regions were formerly thought to be seas, and still bear marine names, such as the Syrtis Major, on the maps; this view was abandoned for many reasons, such as the absence of a reflection of the Sun, the weakness of the line of water-vapour in the spectrum, and the seasonal changes of tint. But Mars still remains the most Earth-like of any of the worlds within reach of telescopic scrutiny.

The Giant Planets. We next consider the family of giant planets, Jupiter, Saturn, Uranus, and Neptune. Jupiter exceeds the Earth 1312 times in bulk, and 318 times in weight; for Uranus, the smallest of the group, the figures are 59 and 15. It would have seemed likely that the attraction resulting from their large masses would have compressed their materials more tightly, but the above figures show that the reverse is the case. In the last century, when a much shorter time-scale was in vogue than that now accepted, it was believed by many that these planets still retained enough of their primitive heat to explain their expanded condition. But the application of the radiometer to the question during the last thirty years indicates that the outer layers of Jupiter have a temperature of about 100° Centigrade below zero, whilst that of the outer planets is presumably still lower. This does not, however, preclude a much higher temperature in the deep interior of the planets; indeed the very violent disturbances that have been witnessed on their surfaces, the great red spot on Jupiter, and two great white



THE MILKY WAY

The photograph shows part of the Milky Way in the constellation of Cygnus, the Swan
Photo Wide World

spots that suddenly appeared on Saturn, bear witness to much energy in their deep interiors; the deep-seated origin of the spots was proved by their rapid westward motion, indicating that they came from a region of slower rotation. The fact that the light of both Uranus and Neptune has at times been variable suggests that they also experience these outbursts,

though they are too distant for exact observation of the details.

Pluto, the most remote of the known planets, was found in 1930; photographic images of it were found on plates dating back to 1914, which enabled astronomers to deduce its orbit accurately; its average distance from the Sun is $39\frac{1}{2}$ times that of the Earth, or more than



THE NEBULA OF ANDROMEDA
The most conspicuous of all the nebulae
Photo Keystone

100 times that of Mercury; this means that the heat received from the Sun is less than one ten-thousandth part of that on Mercury; so that, while lead would melt on Mercury, any air that may be present on Pluto would probably be in a liquid or solid form. However, the path of Pluto is so eccentric that its distance from the Sun varies between from thirty to fifty times that of the Earth, and the light and heat received when nearest is nearly three times that when farthest from the Sun. When nearest, it penetrates inside the orbit of Neptune, the only case among the principal planets of one planet invading the territory of another; collision is not possible, as the paths lie in different planes.

The general conclusion from this survey of the system of planets is that we need consider only two orbs, in addition to the Earth, as possible seats of life. These are our nearest planetary neighbours Venus and Mars. The presence of vegetation on Mars is considered likely by most observers; from terrestrial experience we should expect this to be accompanied by at least low forms of animal life. The late Prof. Percival Lowell considered that the system of canals on the planet was artificial, and gave evidence of design by intelligent beings. The view is supported by some astronomers, but the majority prefer to keep an open mind, and not to base important conclusions on such difficult objects as the Martian canals. Many deny that they are as narrow and regular as Lowell asserted. But it is to be remembered that he chose the site at Flagstaff, Arizona, after examination of several sites, because of the clearness and steadiness of the

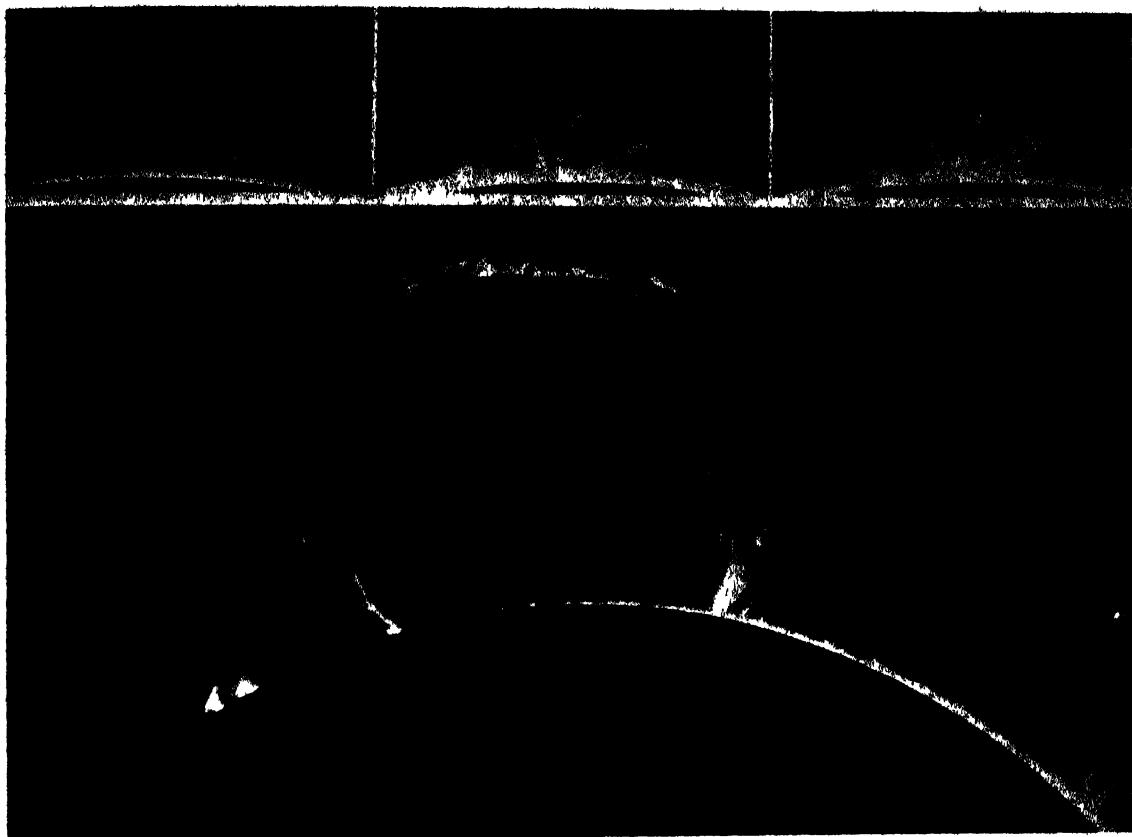
air there, and that his refractor, though not so large as several others, was of the highest quality, and gave excellent definition.

As regards the habitability of Venus we can but speculate, as we see only its cloud-laden atmosphere; the presence of these clouds, however, renders the presence of oceans on its surface highly probable. Moreover, the nearness of the planet to the Sun promises a genial temperature, and the close resemblance of the planet to the Earth in size and mass suggests a similarity of other conditions also. The chief argument against its habitability is the deduction, from spectroscopic observations, that the rotation is much slower than that of the Earth; this would imply great heat in the day from the prolonged radiation from the near-by Sun, and great cold at the latter part of the long nights. The dense cloud layers might do something to mitigate these discomforts.

The Earth-Moon System. The system of Earth and Moon is unique among the planets. The Moon is the only satellite that is comparable with its primary in size, and the only one that exerts any appreciable influence on its primary. Some of the satellites of the giant planets are larger than the Moon, but they are insignificant compared with their primaries, which are larger and more massive than the Earth. The tides have already been spoken of, but it is well to go more into details; the Moon pulls the whole Earth, but it pulls the part nearest to it more strongly than the distant part. The solid Earth is pulled without much distortion, but the mobile waters of the ocean are free to obey the pull. The actual action is too complicated to describe here, but we may take as a rough approximation that the water under the Moon is heaped up, while the solid



CRATER CAUSED BY A METEOR
The aerial photograph shows a crater in Arizona caused by the impact of a huge meteor on the Earth. The crater is 4000 feet across and 600 feet deep
Photo: Topical



TYPES OF SOLAR PROMINENCES

These flames projecting from the surface of the Sun were photographed during an eclipse; they extend for many thousands of miles.

Photo: Keyson

Earth is pulled more strongly than the water on the opposite side, so that this too is heaped up. It may occur to the reader that the Sun, which pulls the Earth much more strongly than the Moon does, should cause much larger tides. There are appreciable tides due to the Sun, but they are not as high as the above argument would suggest; the tides arise from the different pulls which the Sun or Moon exert on different parts of the Earth; now clearly there is more difference in the Moon-pulls on different parts of the Earth than there is on the Sun-pulls, for the radius of the Earth (say 4000 miles) is one-sixtieth part of the Moon's distance but it is only one twenty-three-thousandth part of the Sun's distance. When this allowance is made the Sun's action on the tides is to that of the Moon about as two to five. Still the solar tides appreciably modify the lunar ones. They act together at the periods of new and full Moon, giving Spring Tides with a height of five plus two, or seven; they are opposed to each other at the first and last quarters of the Moon, giving Neap Tides, with

a height of five minus two, or three; thus the Spring Tides are more than twice the height of the Neap Tides.

It is easy to see that the tidal wave travelling round the Earth in the opposite direction to its rotation must act as a brake to check the rotation. Now long before this result was foreseen, it was concluded by Halley and other astronomers, from a study of ancient eclipses, that the Moon's motion was being accelerated. This is really a very complicated phenomenon, being due to several causes, some of which will in time act the other way. One of these causes acts continually in the same direction; this is the tidal brake on the Earth's rotation, causing the day to lengthen, so that the Moon travels a little farther in the lengthened day. As a sort of reaction to this tidal action, the Moon is pushed outward, so that its distance from the Earth is increasing. It is assumed that this action will go on till the Earth always turns one face to the Moon, as the Moon now does to the Earth. Both the day and the Lunar Month will then last about six of our present weeks.

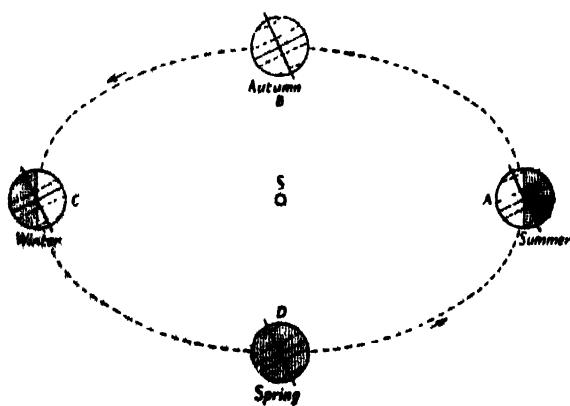


FIG. 1. THE SEASONS

Diagram showing the influence of the inclination of the Earth's axis

Till a recent date it was commonly asserted that the Moon originally formed part of the Earth, and had separated from it under the influence of the Solar Tides on the Earth; it was then that it began to cause tides on the Earth, and to cause its rotation to grow slower. The reaction of these tides caused the Moon to recede, as explained above, till the present state of things was reached. This theory is no longer held so confidently, as mathematical difficulties have been pointed out, but it has not been abandoned by all. It is clear, in any case, that the present length of the day is to a considerable extent the result of the Moon's tidal action; the two bodies interact on each other in so many ways that we cannot, in any astronomical discussion, consider one body alone, but we must always consider them as a closely connected pair.

Day and Night and the Seasons. The Earth journeys round the Sun in an orbit, which is elliptical but almost a circle, in a year of approximately 365½ days. At the same time it spins round every twenty-four hours on its axis which is inclined to the plane of its orbit at an angle of 66½°. The first motion is called "revolution," the second "rotation." The rotation of the Earth gives us alternate periods of light and darkness (day and night). The revolution of the Earth and the inclination of the axis cause the seasons (see above).

It is commonly stated that the Sun rises in the east and sets in the west. Although this is very nearly true in tropical regions, observation made throughout the year will show that it is far from correct in Britain. Only in March and September will the Sun be found to rise even nearly in the east or to set in the west. From March to June it will rise a little farther north of east and will set farther north of west

until it rises in the north-east and sets north-west. From June to September the rising and setting points will gradually return to east and west respectively and then from September to December the Sun will rise and set south of east and west until it may rise in the south-east and set south-west. From December to March the direction of sunrise and sunset will approach east and west once more.

In our latitudes we never see the Sun in the north, but in Arctic regions during the summer the Sun does not set at all but travels right round the sky. In these regions the Sun sets farther and farther north each day until it gives daylight throughout the twenty-four hours. In the Antarctic similar conditions prevail during our winter. The North and South Poles both get days and nights which last for six months. A careful study of diagram 1 will make these points clearer.

In the Tropics the Sun appears overhead at certain times of the year but it never does so elsewhere. Regular monthly observations of the height of the Sun at midday will show that it rises to a higher point in the sky each month from 21st December (winter solstice) to 21st June (summer solstice) and then returns again through the same positions during the next six months. From the diagram 2 it will be seen that the Sun is overhead, in March and September at the Equator, in June at the Tropic of Cancer, and in December at the Tropic of Capricorn.

Twilight. Twilight depends upon the atmosphere, refraction, and reflection. For a short time after the Sun has really gone below the horizon its rays are so refracted by the atmosphere that it appears to be still above the

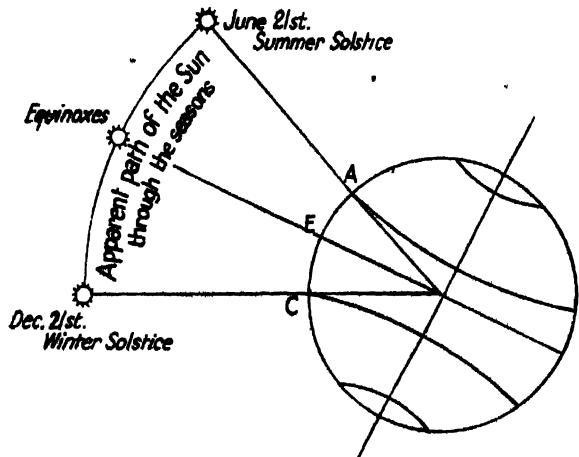
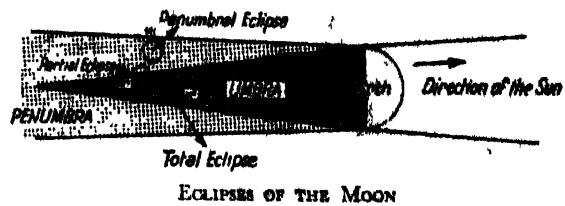


FIG. 2. EQUINOXES AND SOLSTICES

horizon. Later, when invisible itself, its rays continue to illuminate the atmosphere and clouds, and some of the light is reflected to the Earth. Twilight lasts until the Sun has sunk about eighteen degrees below the horizon, but its length depends upon the season, latitude, and state of the atmosphere. Morning twilight is similarly caused.

Eclipses. All planets and satellites in the solar system, being dark bodies illumined by the Sun, must throw shadows; these have two parts—a dark part, the umbra, and a less dark part, the penumbra. The Moon revolves round the Earth in an elliptical orbit slightly inclined to the Earth's orbit. When the Moon is full



Even the Earth's umbra is not quite dark; refraction by the atmosphere bends some reddened sunlight into it.

Similarly, at other times the new Moon passes directly between the Earth and the Sun, hiding part or all of the Sun from us. Even under the best of conditions its shadow, being

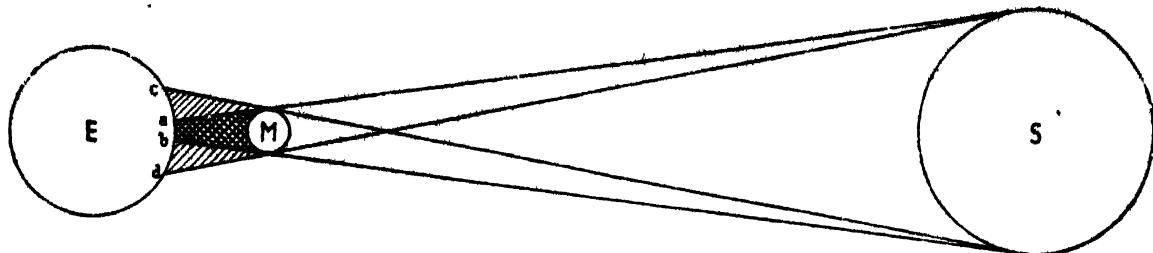


FIG. 3. TOTAL ECLIPSE

Observers between a-b will witness the total eclipse; those between a-c and b-d, partial eclipse only

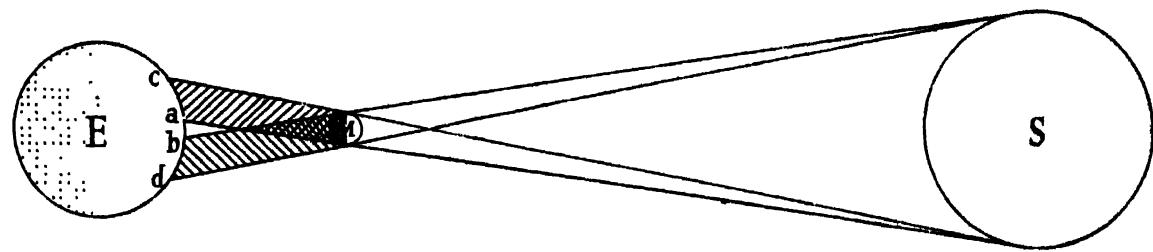
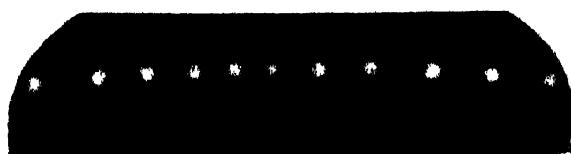


FIG. 4. ANNULAR ECLIPSE

Observers between a-b will see a ring of the Sun surrounding the dark shape of the Moon

and in a straight line with the Sun and Earth, it may pass right into the umbra of the Earth's shadow and thus be hidden from view. It is then said to be totally eclipsed. If it only partly enters the shadow a portion only will be hidden, giving a partial eclipse. Sometimes the Moon only passes through the penumbra. Such penumbral eclipses usually pass unnoticed.



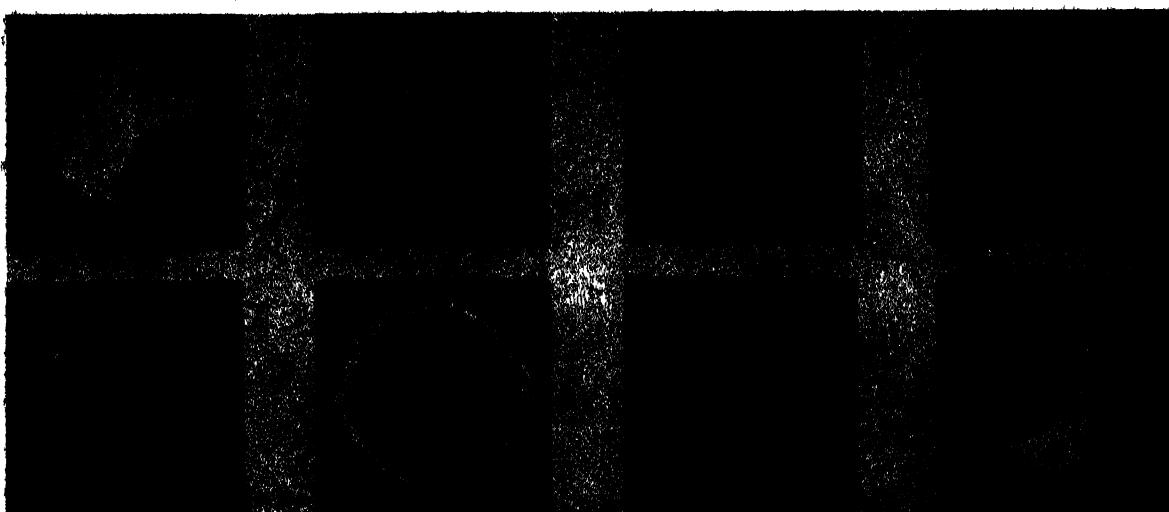
THE SUN DURING THE SHORTEST DAY

It rose at 11 a.m. and set two hours later. The exposures made at intervals at Walker's Park, Alaska, show that it never rose far above the horizon.

Photo: Chapman

much smaller than that of the Earth, is able to cover only a small area of the Earth's surface. The umbra covering at most an area 150 miles in diameter sweeps across the Earth in a narrow belt. Only observers in this track will see a total eclipse. Other observers within the larger penumbral tract will see a partial eclipse (diagram 3). Total eclipses are very rarely visible in any particular place. On an average they occur about three times in 1000 years. The next visible in England will be in August, 1999.

When conditions are otherwise right for a total eclipse, the Moon may be so far from the Earth on its elliptical orbit that its umbra does not reach the Earth. At such times observers situated in area ab, Fig. 4, will see a ring of the Sun surrounding the dark shape of the Moon—an annular eclipse.



STAGES IN AN ECLIPSE OF THE SUN

Photo: Komar

Eclipses, being uncommon phenomena—there can only be seven in any year—have been regarded by the ignorant as signs of impending disaster. The Northmen thought that two wolves pursued the Sun and Moon and endeavoured to devour them. The Chinese thought that a dragon was swallowing the Sun. Sometimes whole tribes were assembled to shout and beat drums to drive away the animals and thus save the celestial bodies. This is still done in some eastern countries.

Astronomers have long known the cause of eclipses and have been able to forecast the day, exact time, and the duration. They have compiled a catalogue of all eclipses from 1207 B.C. to A.D. 2161.

Total solar eclipses are of great interest to astronomers, for the corona, chromosphere, and prominences of the Sun can then best be observed.

Comets and Meteors. Besides the planets there are also comets and meteors in the solar system. Comets *may* be conspicuous objects, and, on rare occasions, visible to the naked eye

even in daylight; but many of them are only noticeable by the aid of the telescope. Throughout the ages they have been objects of superstition and terror. A comet seen in 43 B.C. was thought to be a chariot sent by God to take the soul of Julius Caesar to heaven.

Comets move in very elongated orbits round the Sun. Halley's comet takes seventy-five years to journey round its orbit. Its last appearance was in 1910, the next will be in 1986. Other comets have shorter orbits; Encke's comet returns to view every three and a third years. Comets are only visible when they are near the Sun. When first seen, they appear like a small hazy (or misty) cloud, but as they near the Sun a tail develops which usually points away from the Sun owing to the pressure of light upon the extremely small particles of which it is composed. The head, or nucleus, of a comet is a swarm of meteorites some distance apart. The tail may be millions of miles long, but there is so very little matter in it that the Earth has passed through the tail of a comet without anyone but astronomers knowing about it.

The glow of a comet is due to reflected Sunlight and, possibly, also to the ionization of its low pressure gases by electrons emitted from the Sun.

Meteors—"shooting stars"—commonly seen on clear nights—are not stars but wandering stones similar to igneous rock or lumps of nickel iron alloy, which are travelling unseen through space. Millions of them enter our atmosphere daily, but almost all of them, owing to their great speed and friction with the

COMET FINSLER

The tail of a comet points away from the Sun
Photo: Kuytsev

atmosphere, are burnt up before reaching the Earth's surface. Some meteors move in swarms round the Sun. They may be the result of the breaking up of a comet, for Biela's comet, in 1846, broke into two and finally became disrupted altogether. When the Earth passes its old track in November it meets swarms of meteors, and gathers some of them to itself. Other swarms are met in April and August, and at such times many "shooting stars," which seem to radiate from one particular portion of the sky, are seen. Occasionally a meteor reaches the Earth, and is then known as a meteorite.

Sunspots. Sometimes, when the Sun's disc is examined through smoked glass, dark spots known as sunspots, are seen. Every eleven years there appears to be a period when sunspots are particularly large and numerous. They are not really dark spots but appear so by comparison with the rest of the Sun's disc. They seem to be a kind of whirlwind or vortex in the hot gases of the Sun's atmosphere. From the vortex vast quantities of electrons are shot forth into space, producing a powerful magnetic field. The effect of this stream of electrons is felt upon the Earth. Big sunspots—many times the size of the Earth—often cause magnetic storms, which upset the reliability of our compasses and interfere with telegraphic communication.

The Auroras—Australis and Borealis—seem to be due to the current of electrons from the Sun which ionize the rarefied atmosphere



SUNSPOTS

This photograph was taken with the 100-inch thirty-inch telescope

about fifty or sixty miles above the Earth's surface, causing it to glow. An electric charge acts in a similar manner when passed through tubes of rarefied gas, as in neon tubes.

The Heaviside Kennelly layer, sixty miles above the surface of the Earth, appears to be made up of ions with big electrical charges. It is caused by the electrons from the Sun, and is, therefore, liable to vary with the appearance and size of sunspots. It is this layer which reflects wireless waves and makes them travel round the globe instead of going out into space.

THE LAND MASSES OF THE EARTH

THE only way to get a clear conception of the distribution of land masses over the surface of the Earth is to study a globe. There the main characteristics leap to the eye. First the massing of the land in the Northern Hemisphere. Place the globe so that the British Isles occupy the centre. Within the circle can be seen practically the whole of Asia, Africa and North America, and the northern part of South America. The only land masses found in the opposite hemisphere are Antarctica, Australia, and the remainder of South America.

Then note the way in which the land areas taper towards the south, and that between them are the great ocean basins, wide open in the south and narrowing northwards. Note next how the continents and oceans counterbalance each other on opposite sides of the globe; the great bulge of the Pacific opposite the land mass of Europe and Africa, the North Atlantic on the side

bisects South America is 60° west. This feature is less marked in the case of Europe and Africa, except that northern Africa extends westwards to $17^{\circ} 30'$ west at Cape Verde, while the west coast of South Africa lies about $17^{\circ} 30'$ east. Similarly, taking 100° east as the meridian bisecting Asia, we find that Australia lies balanced about 135° east. Again each of these southward extensions of land is cut deeply by arms of the sea. The Americas are almost severed by the Caribbean Sea and the Gulf of Mexico, between latitudes 10° north and 30° north, the Mediterranean Sea extends eastward some 2400 miles about 35° north, and Australia is separated from Asia by the Malay archipelago about the Equator.

Theories About Arrangement. This orderly arrangement of the continents has given rise to several theories in the endeavour to find an explanation. Perhaps the most suggestive and the most helpful in remembering the main facts is the tetrahedral theory of Lowthian Green. Stated briefly the theory is that the world, being for all practical purposes a sphere which has in proportion to its volume the smallest possible surface, in the process of cooling has contracted towards the form of a tetrahedron, which, when regular, has the largest surface in relation to its volume. Assuming the figure of the Earth to be a modified tetrahedron, the continents can be regarded as lying along its edges, while the oceans occupy the faces. (See Fig. 1.)

Thus, as we see in the figure, the Arctic Ocean occupies one face, the edges of which are marked by the northern coasts of Asia and North America. The land masses extend southward along the other three edges, at the junction of which is found the continental mass of Antarctica. The main objection is that a rotating Earth could not maintain in equilibrium a figure even approaching a tetrahedron. (See Fig. 2.)

Suess attacked the problem from a different angle. He pointed out that there were three great areas in the Northern Hemisphere, where even the oldest rocks lie horizontal, apparently undisturbed. They are (1) the Laurentian

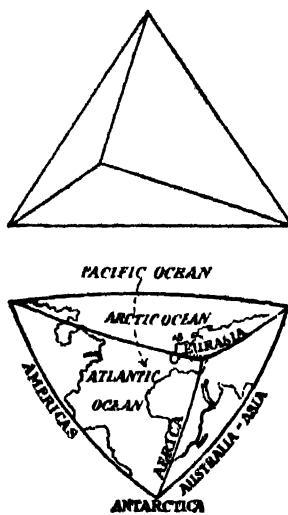


FIG. 1

opposite the compact Australian continent, and the Indian Ocean offset by the continent of North America. The unique continent of Antarctica at the South Pole faces the basin of the Arctic Ocean at the North Pole. But as though to warn us of the danger of hasty generalization, the South American continent is found to lie opposite the archipelago of the western Pacific; not the open ocean.

The land extends southward in three main branches: the Americas, Euro-Africa and Asia-Australia. In each case the southern component occupies a position to the east of its northern part. Thus the meridian which bisects North America is 100° west, while that which

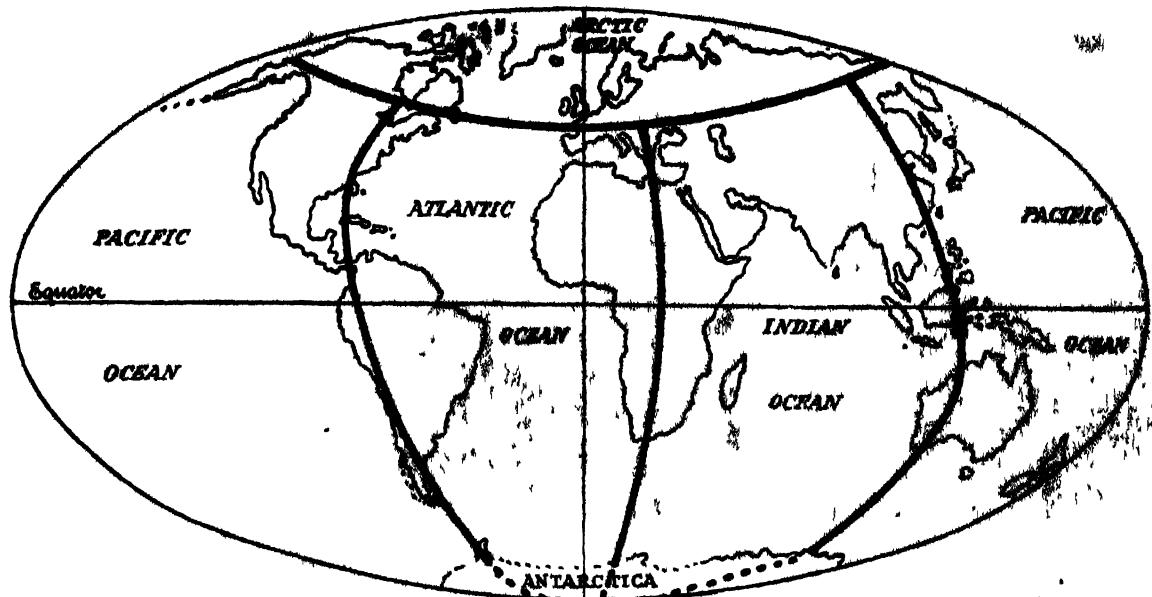


FIG. 2. THE DISTRIBUTION OF LAND AROUND THE EDGES OF A TETRAHEDRON

shield covering the greater part of Canada east of the Rockies, (2) the Baltic shield in Europe, and (3) an extensive area in eastern Siberia, which he called Angaraland. In the Southern Hemisphere similar areas of old undisturbed rocks are to be found in South America east of the Andes, in Africa between the Atlas and the ranges in the extreme south, in Arabia, on the Deccan in India, and in Australia. These areas were too rigid to fold under pressure, so that when folding of the Earth's crust did take place at certain well-established periods, it was the softer more recently deposited rocks between these two areas of rigid land masses which crumpled and formed the great ranges of fold-mountains which traverse Europe and Asia from east to west and America from north to south. The great shields of ancient rock fractured in many places, and the sinking of large portions may explain the formation of the Atlantic Ocean. (See Fig. 4.)

A third hypothesis was put forward more recently by Wegener. Pendulum observations show that the rocks of which mountain ranges are composed are of a lower density than those of the surrounding low lying country. Wegener suggested that the continents have a lower density than the substratum on which they rest, and that which forms the floor of the oceans. As a consequence the continental masses have slowly drifted across the face of the globe in two directions—from east to west and from the poles toward the equator. The feature which

lends most support to this theory and which in fact led Wegener to advance this explanation is the similarity existing between the shape of the eastern and western shores of the Atlantic. (See Fig. 3.)

Supposing that sheets of plasticine were cut to the shape of the continents, applied to a globe and then slid towards each other, the edges would roughly fit together. Although there are several geological and other difficulties to be explained, and nothing has really been proved, the approximate agreement in the outline of the two coasts is certainly striking. Further, for a long time geologists and biologists have endeavoured to find the reason for certain similarities in the rocks and in the floras and faunas of Europe and North America.

The suggestion that has been most generally accepted is that there formerly existed in high latitudes bridges of land. Alternatively many geologists hold the view that there was at one time a continent



FIG. 3

which they name "Atlantis" over what is now the North Atlantic. It is believed that this continent subsided in Tertiary times between great faults, which are now marked by the limit of shallow waters covering the continental shelf. Along this line the sea deepens rapidly to over 1000 fathoms, and then again to a much greater depth. The subsidence was slow and progressive, and was accompanied by lava-flows along the fault lines both in Britain and Iceland. Many earthquakes have occurred along the continental shelf within recent times. The great earthquake at Lisbon in 1755 not only set up great waves at sea but set in oscillation also inland waters in Switzerland, Italy, and even Scotland and Scandinavia. The earthquake off Newfoundland which occurred in 1929 was severe enough to

north-west to south-east direction, particularly in the western parts of the British Isles. The immense thrust required to produce some of the features could scarcely come from glaciers moving down valleys from local mountain centres. Nor could it be derived from a floating ice-field. The possibility is, therefore, that there was either land, or at least a much shallower sea than the present Atlantic, between Great Britain and Greenland, and that the present islands Iceland and the Faeroe Islands constituted a great range of mountains which gave the necessary thrust to the ice-field. So that the ice-sheet may have been continuous from America to Europe in these latitudes. At any rate there is evidence that makes it fairly safe to assume that the glaciation of North America and northern Europe was simultaneous.

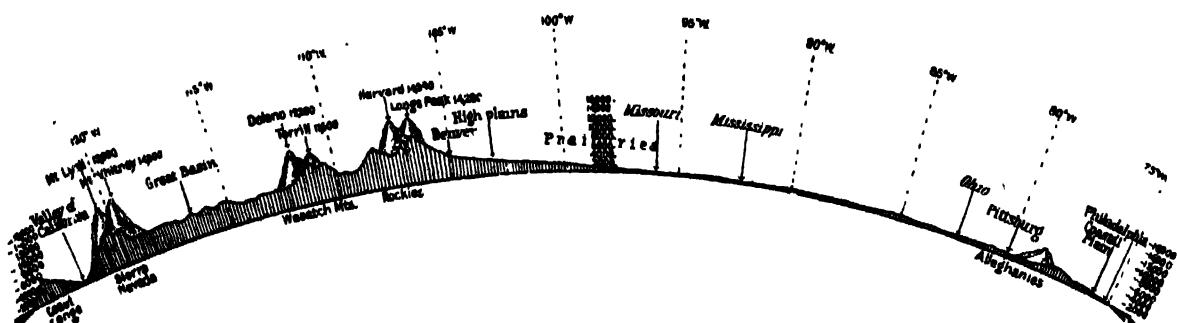


FIG. 4. A SECTION ACROSS AMERICA

break the submarine cables. The Pacific coasts are still more subject to earthquake, especially in the region of Japan.

Another subject which bears upon the relation between the land masses of Europe and North America is that of the Ice Ages. (See map on page 59.) Abundant evidence exists that certainly a large area of Europe and of North America was covered, at least during the Quaternary period, by immense ice-sheets probably over 2000 feet thick. The slow but powerful movement of this ice smoothed and rounded the summits of mountains composed of old hard rock, carved out deep rock basins, sometimes completely obliterated the existing natural drainage and in other places deepened existing valleys, giving them a U-shaped section. The vast collection of rock material thus picked up in the bed of the ice-sheet was transported far and wide and deposited in the form of moraines, drift, and perched blocks when the ice-sheet wasted away in warmer times.

The rock striations which mark the path of movement are frequently found to follow a

With regard to glaciation in the Southern Hemisphere, although there is evidence of a much greater development of glaciers than now exists in New Zealand and Tasmania, in South America and eastern Africa, there is no evidence that it was contemporaneous with that of the Northern Hemisphere, and may well have been alternate to it. Nor must changes of temperature be regarded as the only factor governing increase of glaciation.

Changes of sea-level are evidenced by old beach lines to be seen in Scotland, Scandinavia and elsewhere. These old sea beaches, now several hundred feet above present sea-level, cross rocks of varying age and hardness and great faults, all undisturbed. Suess argued that it was impossible on physical grounds to uplift such complex land masses without some displacement of their component parts. That therefore, where such marine deposits are found raised horizontally, the change must be attributed to a fall in the water level, rather than uplift of the land. The amount of water on the Earth is limited, and if the depth of ocean is

increased in any part by subsidence, the sea-level all over the world falls accordingly. In which case the land appears to have risen without actually having moved. Raised beaches at altitudes varying from a few feet to as much as 300 feet have been found within recent years on Mediterranean coasts. But in some cases—in Norway for instance—the elevation of these raised beaches is not uniform, but increases up the fjords, proving that there has been an uplift of the land. In other words, that when the ice-sheet disappeared the removal of its immense weight was attended by a rise of the land level, a rise which was greatest where the ice had been thickest.

Destruction and Building of Land. Having noted some of the changes which have produced the present land areas of the world, there are some other factors to have in mind before considering the continents separately. Land occupies only about three-tenths of the total surface of the world. The volume of land above sea-level is only about one-thirteenth of the volume of the sea. And if this land were used to fill up the deeps and make a surface of uniform level there would be no visible land, but one continuous ocean nearly a mile and a half deep. As a matter of fact this process of taking the land into the sea is in continual operation. Rocks crumble under the influence of rapid changes of temperature, particularly frost, and chemical changes set up by air and rain-water, besides being attacked by wind-blown sand and sea waves. The fragments continue to find lower and lower levels by the force of gravity and by the transporting agency of running water and moving ice. Fortunately, side by side with the forces of destruction there are other forces which are constructive, such as volcanoes which pour out lava and ash, and internal forces which uplift parts of the Earth's crust. Fig. 6 is an attempt to summarize this great cycle of Nature's forces diagrammatically.

The representation in the diagram of the internal forces is intended to be applicable to any of the three external forces. In other words, that subsidence, upheaval, or volcanic activity may operate at any stage in the weathering, transportation, and deposition of rocks. (See page 42.)

The Northern Hemisphere contains about two-thirds of the total land of the world. The northern shores of the land masses of Eurasia and North America almost encircle the Arctic Ocean along the parallel of 70° north. The breaks in this encircling coast line occur in

the narrow Bering Strait and in the shallow waters which separate Greenland from the continents.

The Continents of America. The two Americas illustrate well Suess's theory that the configuration of the land of the world is due to the two main forces of folding and subsidence. First there is the mighty system of fold mountains following the west coast. In each case the main folds diverge to enclose great tablelands, the Great Basin in North America and the Bolivian plateau in South America. In the north-east of each continent there is a block of old hard rocks, the Labrador peninsula and Brazil. In each case between the two, there is a central plain with but a low watershed separating the northern portion from the southern, drained in the one case by the Hudson, Nelson and St. Lawrence rivers and the Amazon and Orinoco respectively, and in the other by the Mississippi and Rio de la Plata. Both continents are triangular in shape, with the broad base to the north. From a human standpoint the important bearing of this fact is that the larger part of North America is in temperate latitudes, while the larger part of South America lies between the Tropics. North-east of each continent lies an archipelago, unlike, however, in characteristics.

The Rocky Mountain system is about 500 miles wide in Canada, but in latitude 40° north widens to over 1,000 miles. Heights of 12,000–14,000 feet are numerous but Mounts St. Elias and Logan in Alaska and some of the Mexican volcanoes attain 18,000 feet. Plateaux enclosed by mountain chains such as the Columbia or Colorado are all deeply carved by river action. The Columbia plateau lies between the Rocky Mountains and the Cascades, the Great Basin between the Sierra Nevada and the Wasatch range. The basins mentioned and those of Yukon, British Columbia, Idaho-Oregon-Washington are the most peopled part of the mountain region. In central America, south of Mexico the mountains trend east and west and seem to be part of the mountain system of the Antilles, much of which is submerged by the Caribbean.

In the east of North America the Appalachian system stretches some 1,600 miles from the Gaspé Peninsula to Alabama and possesses three main groups. The northern group, high and difficult to penetrate, consists of the mountains of Maine, the Green and the White Mountains enclosing the valley of the Connecticut. They abound with evidence of

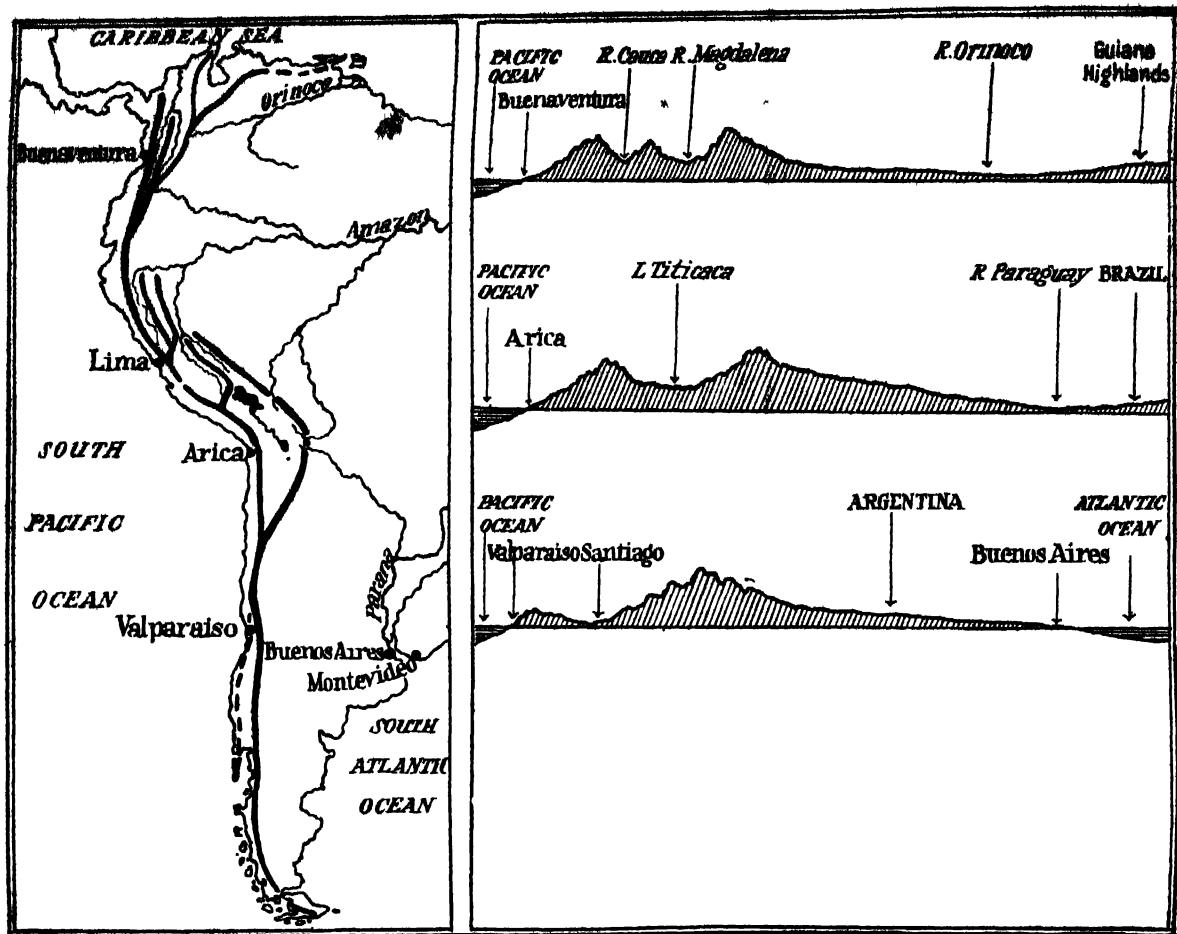


FIG. 5. MAIN FOLDS OF THE ANDES

glacial action. The middle group, broad and easily crossed, consist of the Catskills and other highlands. The southern group extends from Pennsylvania to Alabama. In this part there are three belts: parallel eastern ranges some seventy miles wide rising to 7000 feet; the so-called Appalachian "Valley," thirty to sixty miles wide but broken by ridges 1000 feet high or more; and in the west a plateau presenting a steep escarpment to the valley. The whole range bears evidence of having passed through many geological changes.

A great part of the central plains stands high. Lake Winnipeg, for instance, is 800 feet above sea-level. Two or three hundred miles to the west the prairie rises, first sharply then slowly, to a height of over 1000 feet. In Alberta the average height of the plain is between 2000 and 3000 feet. The meridian of 100° west not only approximately bisects the continent, but can be taken as the boundary between the higher and lower plains, and also as marking differ-

ences between the east and west in climate, vegetation, and human activities.

In South America the Andes have naturally two divisions, the northern half forming a great arc and the southern half running practically due north and south. In Colombia the system has several ranges separated by deep valleys. The Gulf of Guayaquil marks a partial break in the chain. To the north run two main ranges, with the volcanoes Cotopaxi in the eastern and Chimborazo in the western one. The plateau of Ecuador, 9000 feet high, is drained by both Pacific and Amazonian rivers. To the south in Peru there are three main ranges, two of which diverge to enclose the Bolivian plateau which averages 12,000 feet and contains in Lake Titicaca the highest great lake. Peaks overlooking the plateau like Sorota and Illimani attain over 21,000 feet. In the southern half of the Andean system the structure is simpler. There, too, the greatest height is attained in the extinct volcano Aconcagua, nearly 23,000 feet.

Between 26° south and 50° south the system consists of a low coastal range and the lofty main range with an important valley running longitudinally between them. South of 41° south this valley is flooded by the sea, and the coast is characterized by islands, inlets and landlocked channels. North of latitude 41° south the valley contains many newer rocks and fertile soils—the fertile valley of Chile.

In contrast with North America the central plains are low, and the watershed between the Amazon and the Orinoco does not prevent flood water flowing sometimes to the one and sometimes to the other river. The Paraguay, 2000 miles long, the Parana and the Uruguay drain one-fifth of the continent, and the fall is gentle.

The eastern highlands are tilted tablelands of unfolded strata, deeply carved out by rivers. The Essequibo and Branco rivers separate the Guiana highlands into two parts, the highest being in the west. The Brazilian highlands present a steep escarpment to the sea, rising to 9000 feet. Westward the slope is gentle, and the average height 2000 to 3000 feet. Rivers dissect these highlands.

It is worth while to compare South America with the other southern continents. Most of South America is south of the Equator, Africa is equally balanced about it, and the whole of Australia some 800 miles south of it. Africa attains its greatest width north of the Equator, and South America is widest south of it. America also extends much farther south than the other two continents. Africa reaches only latitude 35° south, and Australia 39° south, as compared with 54° south in the case of America.

The African Continent. In area Africa is nearly four times as large as Australia and about half again as large as South America. The greatest width of Africa, about 5000 miles, is approximately equal to its length. This vast area consists mostly of plateau at an average height of 2000 feet. Despite this great area the length of its coast line is little more than that of South America, and only about half again as long as the Australian coastline. With its height and relatively short coastline Africa is much less influenced by the adjacent oceans than either of the other two continents. Africa, too, is the only continent cut by both Tropics. Australia has the smallest tropical area of the three. The position of the Tropic of Capricorn over Australia should be compared with that of the Tropic of Cancer over Africa.

The physical divisions of Africa are not so obvious as in the other continents. Except in the Atlas region in the north and Drakensberg and other ranges in the south of Africa, the continent is mainly monotonous plateau, about 1500 feet high in the north, but over 3000 feet in the south. The Sahara Desert with extensive highlands forms a distinct division. The other features to be noted are the great plateau of eastern Africa with its volcanoes, rift valleys and lakes, the mountains of Abyssinia (Ethiopia), the Congo Basin, and the unique course of the Nile, which maintains its flow across 1000 miles of hot desert, unreplenished by any rain or tributary. The islands associated with Africa are those off the north-west coast, the Canary, Cape Verde, Madeira and Azores, all of volcanic origin. Ascension, St. Helena and Tristan da Cunha, off the west coast south of the Equator, are also volcanic cones. Madagascar, over 1000 miles long and 300 miles wide, is one of the world's largest islands. In structure a faulted plateau with volcanic cones, it is a remnant of the tablelands which once stretched from Africa to India.

The Australian Continent. The physical features of the Australian continent are simple. The western half consists of a plateau of ancient rocks, mostly about 1200 feet, but rising to over 4000 feet. As in Africa the descent from the plateau to the coast is steep and terraced. The eastern half is divided between lowlands of younger rocks and the eastern highlands. The lowlands consist of the Lake Eyre basin, nearly 1000 miles wide, the Murray-Darling basin, and the lands sloping to the Gulf of Carpentaria. The main divisions of the eastern highlands are the Bellenden Ker Range of north Queensland, the New England Range and the Blue Mountains of New South Wales, the Australian Alps, with Mount Kosciusko, 7318 feet, and the mountains of Tasmania. The North and South Islands of New Zealand lie over 1000 miles to the east of Tasmania. The North Island contains an important volcanic region, but the South Island, mountainous on the west, is structurally more akin to Norway or Scotland.

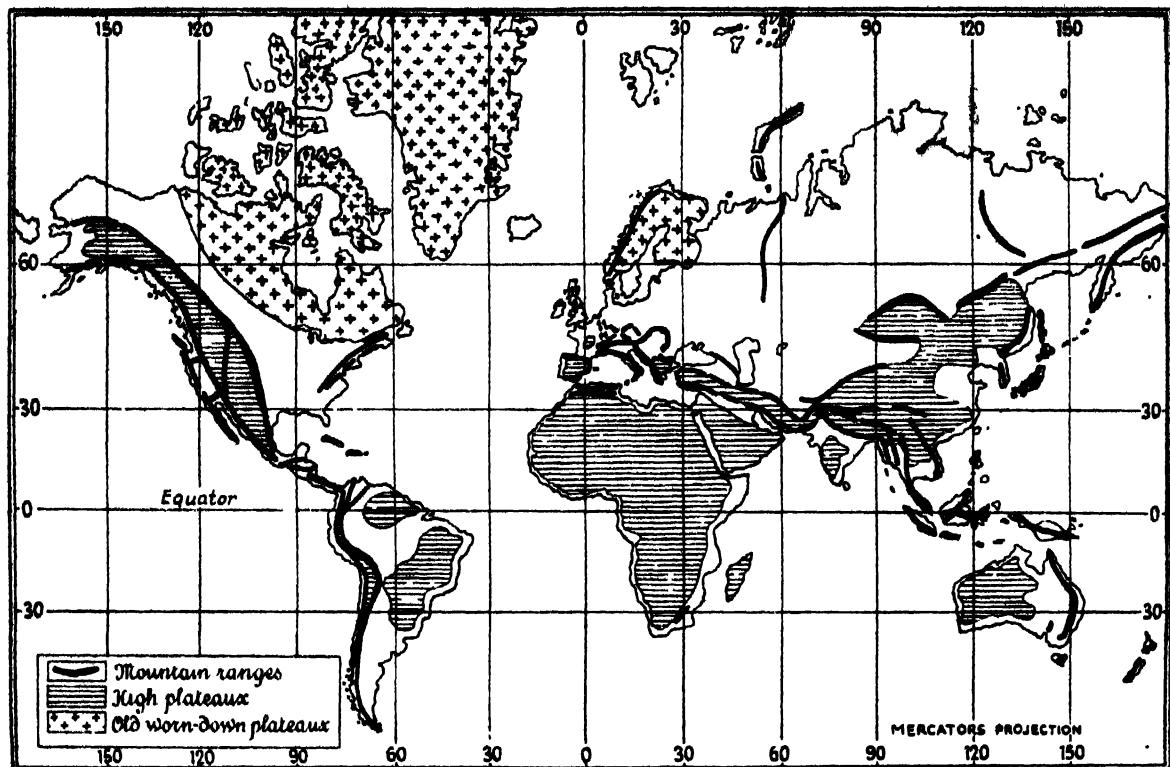
Between Australia and Asia lie the "continental" islands of the East Indies. The western chain of submerged mountains contains Sumatra, Java, and the Sunda islands, the eastern or Pacific chain the Philippines and Moluccas, and between the two are Borneo, on the Asiatic continental shelf, and Celebes separated by the deep Macassar Strait. All

these islands are folded mountains of Tertiary age and many have volcanic rocks.

Mountain Ranges of Eurasia. Perhaps the most conspicuous feature about the land mass of Eurasia is the gigantic system of fold mountains. In Europe there are three main physical regions, the highlands of Scandinavia and Britain, the great plain stretching from the Bay of Biscay to Russia, and the fold mountain system in the south. This system begins in the

Kuen-lun, Nan-shan and Khingan ranges and the northern line consisting of the Tien-shan, Altai, Sayan, and Yablonoi ranges are the Tarim and Gobi depressions. This system contains the world's highest and broadest highlands.

The Pacific coast of Asia is much broken by great faults. The islands of Japan are mainly submerged mountain ranges, some of which are folded, some volcanic, and some blocks of



Pyrénées and continues in the Alps, Carpathians, Balkans, Caucasus, Elburz, Hindu Kush, Kuen-lun, and Himalaya ranges. The main range sends off other ranges enclosing great plateaux or depressions, as, for instance, the Apennines, the mountains of Sicily, Atlas, and Sierra Nevada of Spain. Similarly the Dinaric Alps, Pindus and the mountains of Crete and Cyprus mark out another loop. Asia Minor is enclosed between the Pontine and Taurus ranges. Iran is enclosed between the Elburz and Khorasan mountains in the north and the Kurdistan and Zagros mountains in the south, converging in the Pamirs. South-east of the Pamir the Himalaya and Kuen-lun ranges enclose Tibet. Again, between the line of the

faulted rocks. To the north of this mountainous area of Asia extend the great plains of central Asia and Siberia, which merge into the European plain and can be compared with those of North America. To the south of the mountains lie three peninsulas, Arabia, the Deccan of India, both remnants of the table-lands which possibly extended from Brazil to Australia, and the Malay peninsula. They may be compared with Spain, Italy and the Balkan peninsula in Europe. The plain of Iraq, drained by the Tigris and Euphrates, both over 1000 miles long, the valley of the Indus, 1700 miles long, and the valley of the Ganges, the home of a hundred million people, constitute important features of the world's largest land mass.

THE CRUST OF THE EARTH AND ITS SCENERY

A KNOWLEDGE of the nature of the Earth's crust, and of the forces which are responsible for the variety of natural features seen by the traveller, gives an additional and never ending pleasure to the lover of scenery. The fascinating hobby of endeavouring to explain the origin of the main features of a landscape can only be indulged in successfully by one who understands the nature of the forces which have been, and still are, at work; and who can, therefore, think geologically.

The Origin of the Earth. One theory of the origin of the Earth is that some thousands of millions of years ago a star came close enough to our Sun—then much larger than now—to cause a large mass of the Sun's gaseous envelope to leave the main body and commence to revolve round it. This mass gradually broke up, and, upon condensation, formed the planets of the solar system of which the Earth is one of the smaller members.

However it was formed, men of science agree that the Earth was once much hotter than it is now, and that it was surrounded by a denser atmosphere containing much of the water of the oceans and considerably more carbon-dioxide. No direct evidence of the nature of the original Earth is available; but it is reasonable to suppose that the gaseous mass condensed so that the heavier substances were at the centre, surrounded by more or less concentric spheres of less dense ones, thus producing (1) an endosphere, of which very little is known except that it must have a density about equal to that of iron; (2) the lithosphere consisting of rocks; (3) the hydrosphere or oceans; and (4) the atmosphere or gases.

The Lithosphere. Compared with the diameter of the Earth the lithosphere is only a few miles thick and so it may be regarded as the skin of the Earth. It is composed of about 600 kinds of rock, of which only about a dozen are of common occurrence. Rocks are mixtures of minerals which are usually crystalline and of definite chemical composition. Soft clays, loose

sands and gravels are as much rocks as the harder and more compact granites, limestones and sandstones. There are about 2000 minerals known, but rocks are mainly made of only a few of these. Quartz, or silica, is by far the commonest mineral; and silicates of various elements, such as the minerals feldspar, mica, hornblende, augite, chlorite, epidote, garnet and olivine, together with magnetite and haematite (oxides of iron), pyrites and calcite, are the main constituents of the rocks.

The rocks of the crust are usually hidden from view by a thin covering of rock debris, known as soil, which provides food for the covering of vegetation upon which animals and man are dependent.

Agents of Change. The surface of the Earth is being changed continually by two sets of forces, one destructive and the other constructive. The destructive agents are of two types: disintegrating and transporting. Disintegration of the rocks is brought about by the gases of the atmosphere, expansion and contraction caused by differences of temperature or moisture content, frost, rain, waves, plants, and animals, including man. Rock fragments formed during disintegration may be transported by wind, glaciers, rivers, waves and currents, thus exposing fresh surfaces to the action of the weather, and, ultimately, taking the debris of the rocks to the sea, where it is deposited as pebbles, sand, and mud.

The destruction of rocks brought about by atmospheric agents is known as "weathering." Oxygen, carbon dioxide and water-vapour act chemically upon the surface of exposed rocks, forming oxides, carbonates and hydrated substances, some of which are soluble and may be removed in solution, so leaving the surface in a granular or powdery condition. Even rocks as hard as granite, after long exposure to weather, have a skin of altered rock on the outside which is softer than the rest. This may be seen by knocking a chip off a craggy rock or large boulder.

The effect of the weather upon various rocks may be noticed in old churchyards. The marble of tombstones loses its polish in a few years and the surface becomes rough, granular and furrowed by the action of the rain. In 100 years a third of an inch may be removed by the weather so that inscriptions often become quite unreadable.

Alternate expansion and contraction of the surface of rocks, caused by the fierce heat of the Sun followed by rapid radiation of heat at night, will set up strains which may cause the



SCREES OF ANGULAR ROCK FRAGMENTS
Honester Pass, Cumberland
Photo: H. E. Taylor

surface to powder, peel or chip. Such action is much more frequent in hot, arid climates than in ours. Rain soaks into pores and cracks of rocks: if the water freezes, the consequent expansion forces apart the grains, or further widens cracks, so that, when the thaw follows, chips of rock may be dislodged. Heaps of angular rock fragments, produced by the action of frost, form large screes below many a mountain crag.

Roots of plants penetrate into cracks in search of food and moisture. The power of growth of a root is enormous: by it small cracks are enlarged and huge boulders may be dislodged from hillsides, thus exposing fresh surfaces to the action of the weather.

Burrowing animals such as rabbits, moles, foxes and worms, dislodge considerable quantities of soft rocks and expose fresh surfaces. Man removes large quantities of rock for building, road making and other purposes. His underground excavations for coal, salt and metallic ores often cause local subsidences and interference with natural drainage.

The sea, particularly the force of the waves during a storm, wears away the softer rocks. Sand, pebbles and boulders are washed against

the cliff foot, both pounding it and wearing themselves to smaller fragments. Waves, dashing against a cliff, force air into cracks and joints of the rock with almost explosive force. This widens cracks and may eventually cause falls of rock. There is more destruction caused by the moving pebbles, boulders and air than by the movement of the water of the waves. The sea can only wear away the base, so one might expect that most cliffs would overhang. That cliffs usually slope backwards from the sea proves that the quiet action of the weather can produce a greater effect than the more blustering action of the waves. ✓

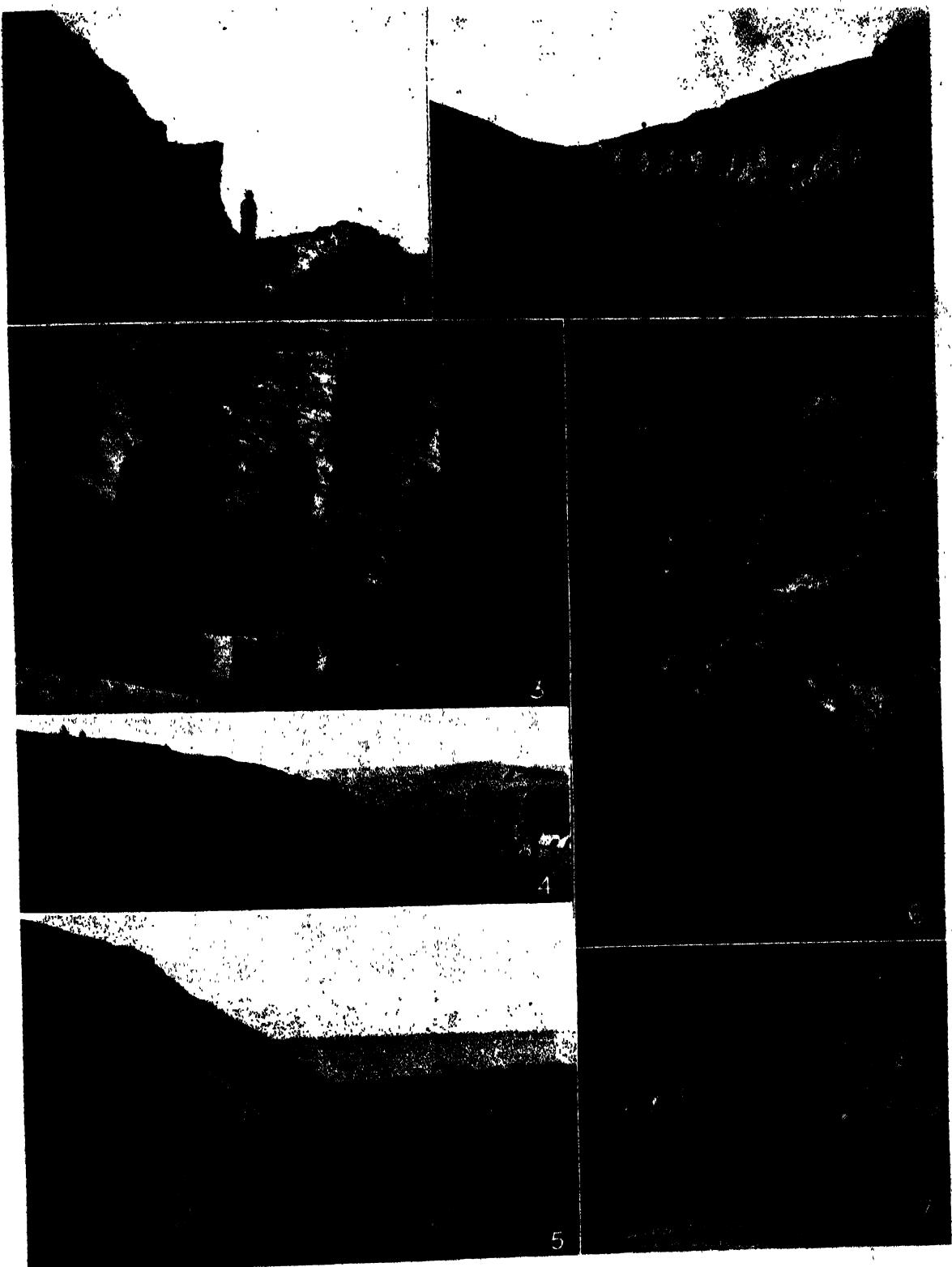
Transportation of Rock Rubbish. The accumulation of rock debris tends to protect the underlying rock and produce a soil. The transporting agents, wind, glaciers and rivers, tend to prevent this and remove sand and soil, thus exposing fresh surfaces.

In dry climates the effect of wind in transporting sand, dust or soil is sometimes disastrous. The sandstorms of desert countries are familiar instances. Large tracts of land in the U.S.A. have lost huge quantities of soil which have been blown away following years of drought. Sand from the seashore, blown by the westerly winds, has formed dunes along many of the western shores of Europe. Along the shores of the Bay of Biscay such dunes advanced inland sixty or seventy feet per year until arrested by the planting of pine forests.

Mountain streams, rivers and glaciers each carry large quantities of rock, sand or mud from the high ground to lower levels. Glaciers drop the larger and heavier portions of their loads when they melt, but the finer material is carried much farther by the streams formed from the melting ice. The heap of large rock fragments dropped by the glacier is known as a moraine. When a glacier ends in the sea, the icebergs which are broken off by the waves carry debris when they float away. In this way the banks off Newfoundland have been formed.

Rivers and streams roll stones along their beds, or even carry them along if the current is strong enough. Even slowly moving rivers carry immense quantities of sand and mud right to their mouths. The amount of material removed in solution is also important. It is estimated that 1500 tons of soluble rock material (two thirds of which is calcium carbonate) is carried to the sea by the Thames every twenty-four hours.

Some of the rock rubbish transported by glaciers and rivers is deposited on the land.



ROCK FORMATIONS

1. Unconformity, Redcliffe, Portishead, Somerset. Dolomitic conglomerate resting on the upturned edges of denuded Old Red Sandstone.
2. Basalt resting on chalk at Cave Hill, Belfast. 3. Old Red Sandstone near Portishead, showing joints along which erosion takes place, variation in coarseness of the deposit and false or current bedding. 4. Greensand escarpment at Shaftesbury, Dorset. 5. South side of Weymouth Haven, Cornwall, showing slates highly inclined with cleavage horizontal. 6. Conglomerate of Old Red Sandstone age at Cusheadon, Northern Ireland. At the bottom left corner is an old sea cave. 7. Fault in Lias Clay at Staithes, Yorkshire

Glaciers leave perched blocks and moraines. Rivers deposit portions of their loads in lakes, in the bed of the lower part of the river, or even on the fields in times of flood. Such deposits are, however, of a temporary nature only. The final resting place of the rubbish is the sea.

Stones and pebbles are deposited near the shore, the sand farther out and mud in deeper water or in sheltered bays and inlets. Such

Formation of New Rocks. Such sediment laid down in layers—or strata—under water are the raw material from which new rocks are formed. Shingle when cemented together will form a conglomerate. Sand, mainly composed of silica and mica, when hardened or cemented will form sandstones and grits. Muds may form clays or shale, and calcareous oozes or coral reefs may be cemented and hardened to form



GLACIERS DESCENDING FROM THE JUNGfrau

Note the peak serrated by frost action

Photo Planet

beds of waste material may be seen near many of our seaside resorts: they form bars, sand-banks and deltas.

The soluble matter brought to the sea is largely used up by marine plants and animals, which can extract it from solution and use it to build up stony skeletons or protective shells. The tiny shells of dead foraminifera and radiolaria form oozes which are spread over thousands of square miles of the ocean floor; the coral polyp is responsible for large reefs such as the Great Barrier Reef of Australia, which is 1200 miles long and 50 miles broad.

limestones. Numerous layers of limestone, sandstone and clay hardened by pressure, cementation and chemical changes are found far from the sea and at great heights. The greater part of England is made of layers of such rocks. Ripplemarks in sandstones and remains of fish, crustaceans, molluscs, corals and foraminifera in clays and limestones are evidence of their aqueous origin.

As the sediments rise above sea-level shrinkage due to loss of water causes vertical cracks to appear at right angles to the bedding planes, or planes separating the different layers. Such

cracks are known as joints. Master joints, large joints or cracks which pass straight through a number of layers, are probably due to tension caused by upheaval. Large joints assist the action of waves and weather in breaking up the rocks and to some extent affect the character of cliffs and mountain crags. As the joints and bedding planes break the layers into rectangular blocks they are extensively used in quarrying operations.

Earth Movements. The effect of the weather, rivers, and glaciers is to wear away the land and deposit the debris as sediment beneath the sea. In time all the land should vanish, but movements of the Earth's crust prevent such a catastrophe. Layers of sandstone and limestone being found on the tops of hills show that these must have been raised by some force. In cuttings and cliff sections we often see that the layers are not horizontal, as they were when laid down, but inclined, curved or upright. In many places round our shores (Carmarthen Bay for example) we find the remains of ancient forests now below sea-level; in other places (as along the coast of Scotland, Cornwall and Devon) we find raised beaches.

The crust of the Earth, therefore, must have moved upwards in some places and downwards in others. Large amounts of sediment must press heavily upon the crust below them and cause it to sag. The sagging causes a lateral pressure which can most readily be relieved by an upward movement. This will cause elevation of that portion of the crust from which a load has been removed. There are other forces which may cause movements of the crust. Some say that the continents are slowly drifting and causing a crumpling of the floor of the sea. Others believe that tidal forces acting upon the Earth may have some effect upon the crust; and still others that the contraction of the Earth, due to cooling, may cause the crust to wrinkle.

Whatever the cause, it is certain that the crust does move, although the movements are

so very, very slow that they are not perceptible during a lifetime. Only steady and extremely slow pressure could cause rocks to bend; sudden or violent movement would shatter them.

During the movements of the crust the layers are bent into curves, smoothly undulating when the pressure is comparatively slight, but



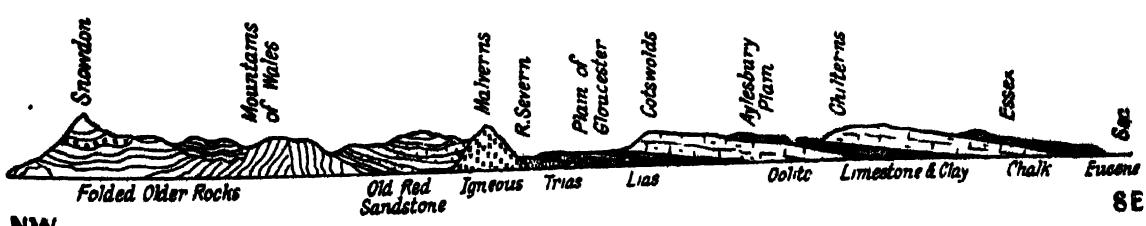
RAISED BEACH PLATFORM

Glaistrumman, Ireland

Photo J. R. Sheldrod

very sharp when the force is great. The folds in the south-east of England are of the gentle sweeping type, but in Wales, Devon, Scotland, the Alps and many mountain regions, they are often very sharp and complex. Sometimes the layers, unable to bend sufficiently, have snapped and produced cracks known as "faults" or "thrusts." Large faults may give relief by allowing a portion of the crust to drop as in the Great Rift Valley of Africa, or by allowing some layers to over-ride others, as in the case of the Moine thrust in Scotland.

When the rocks are curved upwards an arch or anticline is formed. The corresponding downward curve is a trough or syncline. Inclined and upright strata are usually small portions of large folds the upper portions of which have been worn away since, or during, elevation. The Jura Mountains are carved out of folded strata, the anticlines still forming the heights and the synclines the valleys. Commonly, however, in folded country subjected to long periods of denudation, anticlines are



SECTION ACROSS ENGLAND AND WALES
Newer gently inclined strata with scarps in the east; older folded and faulted strata in the west
(After Ramsey)

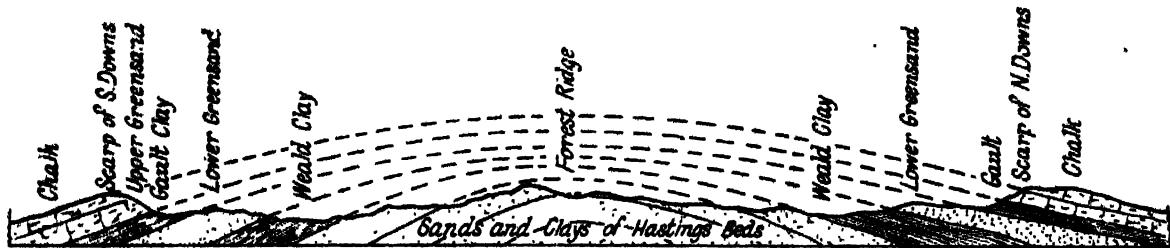


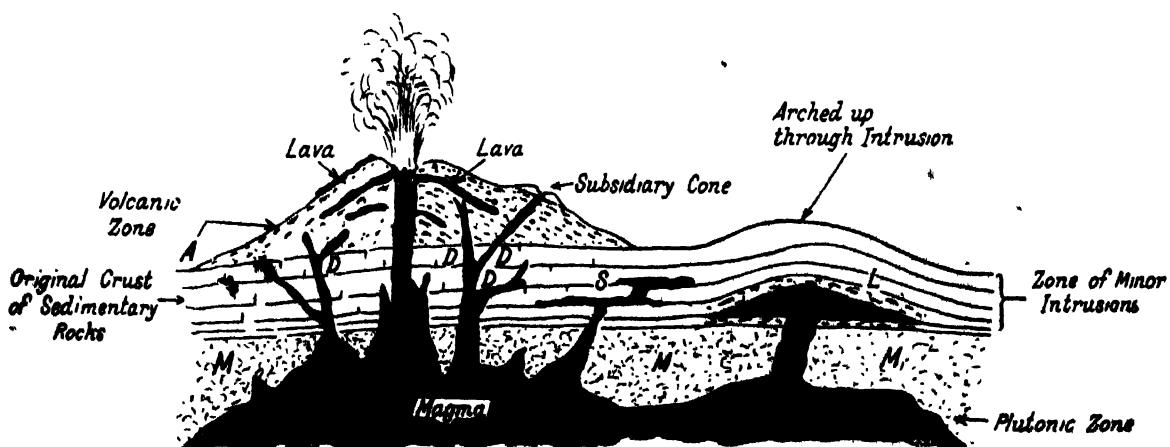
FIG. 1. SECTION OF WEALD ANTICLINE

worn down to form valleys and the synclines form the hills. Snowdon is a remnant of a syncline. The Weald, now a valley, has been produced by the wearing away of a large anticline (Fig. 1). The London basin is the syncline which corresponds to the Wealden anticline. The wearing away of portions of folds gives us access to old rocks which would otherwise be covered with later formed layers.

During geological time, a thousand million years or so, there have been many periods of uplift and depression of various parts of the crust, especially those parts on the borders of continents and oceans. As each elevation took place the destructive forces began to act upon the new rocks, carving them into rugged scenery, and, if time permitted, wearing them down to a monotonous level, or peneplain. When depression followed, new sediments, made by the wearing away of some other land, would be laid down across the worn, upturned edges of the older strata. These new layers are said to be unconformable upon the older ones. The sands forming around our shores to-day are new rocks being laid down unconformably upon the older rocks. Every unconformity must necessarily represent a long period of

time, during which the older rocks were uplifted and worn away before the depression took place which allowed the newer ones to be deposited on their worn edges. When the sedimentary rocks over a large tract of country are examined, it becomes apparent that numerous layers of sandstones, clays and limestones have been formed at different periods in its history. Naturally the newer layers are formed on top of the older ones. This simple fact—known as the "superposition of strata"—was first realized by William Smith, in 1790, when he also discovered that layers formed at different times contained different sets of fossil remains of animals and plants. Since then, by the study of the strata and their fossil contents, geologists have been able to unravel something of the history of the Earth prior to the advent of man.

Volcanoes and Igneous Rocks. Besides the aqueous or sedimentary rocks formed by the agency of water there are new igneous (fire formed) rocks being produced by forces from within the crust. In some places, low down in the lithosphere, there are rocks which are so very hot and under such great pressure that they exist in a plastic and potentially liquid condition; they are highly charged with

FIG. 2. DIAGRAM SHOWING THE FORMATION OF A VOLCANO
D = Dykes. A = Ashes (tuff). S = Sill. L = Laccolite M = Metamorphic Rock



ROCK FOLDING IN CORNWALL

1 A recumbent fold on the north side of Crackington Haven 2 Crumpled beds of sandstone and shale showing zig-zag folding in Culm Measures at Millook Haven 3 Anticline and syncline in Culm Measures at Bude

Photos H. E. Taylor

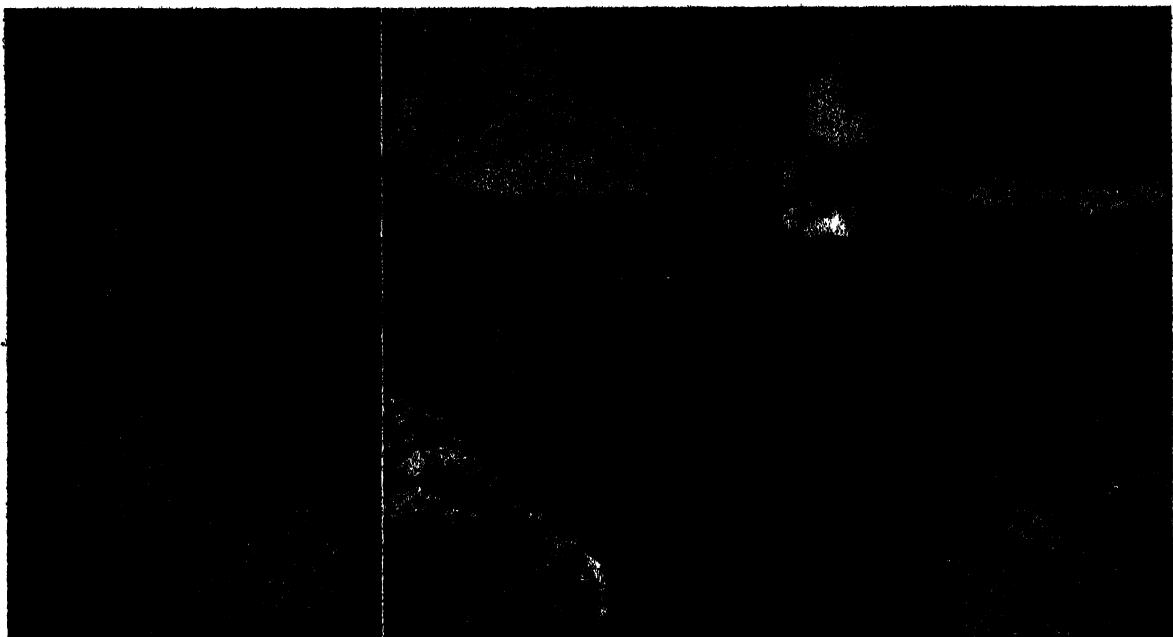
gases and superheated water which has seeped down from above. When pressure is relieved by denudation, or by Earth movements, the rocks melt and become impregnated with large volumes of steam and gases. Such a mass of molten material is known as magma.

As the pressure of the gases increases, the magma is forced into every crack and fissure of the rocks above. At last the gases may escape by blasting a way through to the surface; they carry with them fragments of rock, and some of the molten rock (lava), which is blown out as a kind of spray. On cooling this molten rock solidifies to form dust or "ashes," lapilli and volcanic bombs. The ejected material falling on the surface round the vent forms a more or less conical heap known as a volcano. Once a vent has been formed it tends to act as

a safety valve through which, from time to time, steam, gases, "ashes" and liquid lava may be sent to the surface.

The shape of the cone depends upon its composition (whether chiefly ashes or a mixture of lava flows and ashes), the nature of the lava (whether liquid or viscous), and the type of eruption (whether explosive or not). Vesuvius has a new cone within the remnants of an old one, the top of which has been blown off. Etna has subsidiary cones on its flanks. Mauna Loa in Hawaii, although 14,000 feet high, has a slope of less than ten degrees and a diameter of seventy miles, because the lava ejected is very fluid and flows considerable distances before it solidifies. Fujiyama, the tall and shapely volcano in Japan, is a cone of "ashes."

The volcanoes of the world appear to be



VOLCANOES

Left: Volcanic plug showing columnar joining at Kinraig point, Elie, Fife. *Right:* Volcanic cone of Vesuvius
Photos. J. R. Sheldor; Fox

formed along lines of weakness due to faulting or folding.

A lava stream on solidifying may be slaggy on top due to the included gases, and more stony in the centre. If the stream cools quickly rocks with a glassy texture like obsidian or rhyolite are formed; but if it cools more slowly tiny crystals will develop and such rocks as basalt and andesite are produced.

When a volcano ceases to be active any magma in the pipe will slowly cool to form a plug. This, like the material forming sills, dykes and laccolites (Fig. 2), will cool so slowly that crystals will have more time to grow and the resulting rock will, therefore, be more coarsely crystalline than basalts and andesites which have cooled on the surface.

Though during historical times there have been no active volcanoes in the British Isles, formerly many existed; the rocks they formed may be readily studied.

There are no craters or perfect volcanic cones to be seen as the denuding agents have worn them down beyond recognition; but there are the remains of many lava flows, dykes, sills, plugs and volcanic breccias, agglomerates and tuffs. The Antrim plateau is a large and thick sheet of lavas which have solidified to form basalt. The most famous portion of this sheet is the Giant's Causeway,

where joints, developed as the lava cooled, have produced the well-known polygonal columns. Other great sheets of lava—basalt—are found in Scotland and the western islands—notably Skye, Mull, and Ardnamurchan.

Innumerable dykes have been exposed by denudation in parts of Scotland, Ireland, Wales and England. According to their chemical composition and their resistance to chemical weathering, they may stand out as walls or produce trenches among the sedimentary or igneous rocks through which they have been intruded. The trench between Scawfell and Scawfell Pike is occupied by a dyke which has weathered more rapidly than the surrounding rock. A large dyke nearly 100 miles in length known as the Cleveland Dyke crosses Yorkshire.

The distinctive scenery of much of the lowlands of Scotland is largely due to andesites, basalts, dolerites and tuffs which, owing to their resistance to weathering, stand out as bold hills. The isolated crags of Arthur's Seat, Edinburgh, and Dumbarton Castle are plugs of ancient volcanoes; Salisbury Crag, with its precipitous walls, is a fine example of a sill now exposed by denudation of the rocks which once covered it. The Borrowdale district of Westmorland is a mass of volcanic lavas and ashes of very ancient date; volcanic

agglomerates form part of the scenery of the Charnwood Forest district of Leicestershire.

When the volcanic energy of a district is fading away solfataras, fumeroles, mofettes, geysers and mud volcanoes may be the only manifestation of the activity. Fumeroles emit little besides steam. Vents emitting acid vapours such as hydrochloric acid, sulphuretted hydrogen and carbon dioxide are known as solfataras after the dormant volcano of that name near Naples. The acid fumes give rise to deposits of sulphur, and chlorides and sulphates are formed by their action on the minerals in the surrounding rocks. Mofettes such as those in the Laacher See, Eifel; the Valley of Death, Java, and Death Gulch, western America, give off such quantities of carbon dioxide that insects, birds and even animals, such as tigers, deer and bears, are found dead in their vicinity through suffocation.

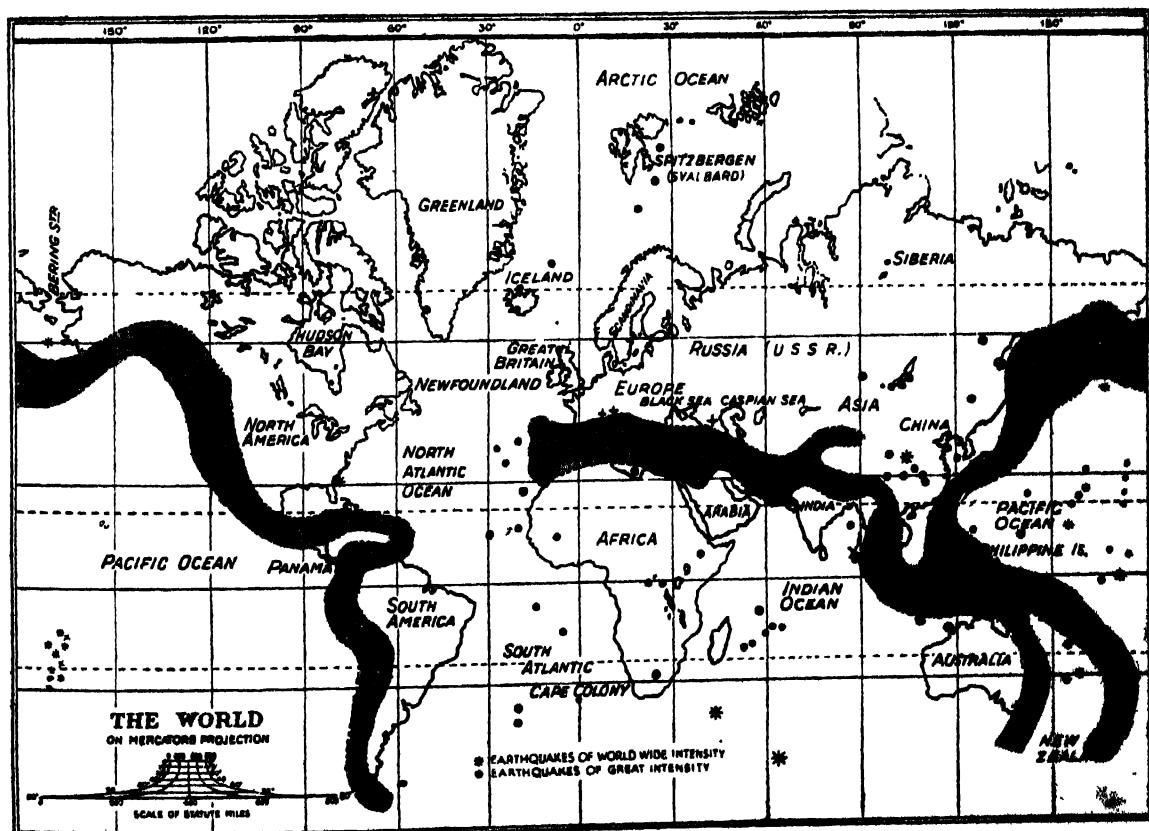
Geysers are deep fissures in volcanic areas into which underground water percolates. The rocks, being still at a high temperature, heat the lower portion of the water to 212° Fahrenheit.

heit, but the pressure of the column of water above prevents boiling. As the temperature continues to rise, a time comes when the pressure is insufficient to keep the superheated water in a liquid condition. Water low down in the pipe then changes to steam and the column of water is blown high into the air as the steam escapes.

Water at high temperature and under pressure has great solvent power. Consequently water emitted from geysers is highly charged with mineral matter, some of which, being insoluble at lower temperatures, is deposited round the vent, so forming a rim, and sometimes terraces, of siliceous sinter.

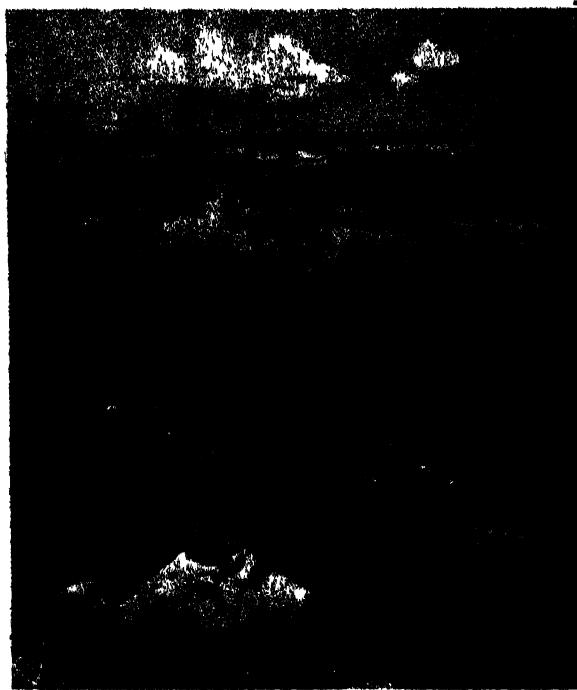
Many geysers are found in the Yellowstone Park of America one of which—Old Faithful—throws a column of steam and water 100 feet into the air every sixty-three minutes. Iceland, Ferguson Island near New Guinea, and the North Island, New Zealand are other places famous for geysers.

Hot springs are usually found in old volcanic areas where the ground is still hot, but



MAP OF THE WORLD'S EARTHQUAKE BELTS

Volcanoes and earthquakes appear to occur along lines of weakness due to faulting or folding. Map prepared by the British Geological Survey
Courtesy: Wide World



GRAND CANYON OF THE COLORADO

Streams have cut deep, narrow trenches, a mile deep in places. Rainfall being small, the stream has cut downward so quickly that the weathering agents have been unable to widen the gorge.

Photo Fox

sometimes, as at Bath, they are found far from the scene of any recent volcanic activity. In such cases the water is not usually very hot, probably due to the fact that the spring is very deep seated and so is warmed by the same heat that causes the rise of temperature in deep mines.

Mud volcanoes are probably due to the escape of steam and hot water through beds of tuff or other unconsolidated rock material. There are examples in the Yellowstone Park and in the North Island, New Zealand.

Plutonic Igneous Rocks. All the magma in a reservoir is not extruded through the vent to the surface: much of it is forced into the crust especially during, and after, periods of great folding. Such masses—called laccolites and bosses—cool and solidify extremely slowly under a cover of rock and so have time to become wholly crystalline. In many places extensive denudation has removed the cover and exposed the underlying crystalline rocks. Like the rocks formed from extruded lavas, these intruded rocks vary in composition. A magma which would have produced obsidian (a glassy rock), if cooled quickly at the surface, may form a granite, while that which would have given basalt or andesite at the surface

may produce gabbro or diorite when cooled within the crust.

Such deep-seated (plutonic) igneous rocks as granite, syenite, diorite and gabbro are most commonly found among the older sedimentary rocks which have been subjected to denudation for such long periods that the cover has been partially removed. Later formed plutonic rocks are still buried beneath their cover awaiting exposure in the distant future. Masses of plutonic rocks, especially granite, form the cores of many mountain chains. Dartmoor in Devon is a great mass of granite occupying at least 200 square miles. Other large masses occur in Cornwall, Aberdeenshire, south-west Scotland, Shap Fell in Westmorland, and in the Mourne and Wicklow Mountains of Southern Ireland.

Plutonic rocks, being usually hard and highly resistant to the action of the weather, are largely quarried for building and road making. Cornish, Aberdeen, Shap and Peterhead granites when polished make handsome rocks for decorative work.

Metamorphic or Altered Rocks. Metamorphic rocks form a large portion of the continental areas and are found in most mountain chains either old or new. The Highlands of Scotland, Northern Ireland and parts of Scandinavia are portions of one great mass of old metamorphic rocks.

Great heat and great pressure, or both together, can alter the nature of either igneous or sedimentary rocks by producing new structures and rearranging the chemical constituents so that new minerals are formed from the materials of the original ones. Heated water and gases and solutions of various substances from a magma, forced under great pressure into cracks and crevices of the rocks above, can act chemically upon the surrounding rocks or deposit fresh minerals from solution in their crevices. In such ways rocks of a different type are formed.

The most common of the metamorphic rocks are gneisses, which are probably altered igneous rocks, and schists, which are often altered sediments. Slates consist of clays which have been chiefly altered by the very great pressure developed during intense folding. Gneisses are commonly made of the same minerals as granite (namely quartz, felspar and mica), but have a coarsely banded structure. Schists are more finely banded and usually consist of quartz with wisps of mica, hornblende, augite or chlorite. Slates have their

particles arranged so that they split or cleave readily into thin sheets.

Many of our valuable accumulations of metallic ores have been formed by the action of hot magmatic solutions which have been forced into cracks and crevices of cooling igneous masses and of the baked and changed sediments which surround them.

Geological History of the British Isles. The rocks of the Earth's crust have been grouped in systems, by geologists, according to their relative ages of formation as determined by the principles discovered by William Smith, the father of British geology. These systems, which can be recognized in all parts of the world where they are found, have been given the names shown in the table on page 55. The same names are applied to the periods of time during which the systems were formed (e.g. chalk, a cretaceous rock, is said to have been formed in the Cretaceous period). Each system of rocks contains many layers—sandstones, limestones and shales and many of them also have volcanic and plutonic rocks associated with them.

The British Isles, being near the edge of a continental mass, have had a very varied history. At various times there have been periods of upheaval, vulcanicity, and subsidence with consequent deposition of sediment.

Deposits of terrestrial or aqueous origin of almost all ages are found so that a study of their history, as shown by the rocks, is almost an epitome of the history of the world.

The table on page 55 has been compiled in order to summarize the sequence of events in the British area from the earliest times until now. It should be read upwards from the bottom.

Scenery. Some landscapes are extremely old, the result of ages of denudation, but others are comparatively recent and due to the sculpture of new strata or of an old peneplain recently elevated. In some cases it may be due to the erosion of newer strata and consequent exposure and further erosion of some older scenery which has been buried for ages. In the Charnwood Forest area a pre-Triassic landscape is now being exposed and further eroded as the covering of Triassic marls is being removed.

The climate of a country determines to a great extent the type of weathering. Tropical districts are subjected to great heat and much moisture. Deserts, such as the Sahara, suffer from extremes of heat and cold but little or no moisture. In temperate regions all the weathering agents are active and in Arctic regions weathering is mainly due to frost and glaciers.

Well cemented crystalline and massive rocks with few division planes such as joints, bedding planes and faults, are more resistant than loose,



GLACIAL VALLEY, WATENDLATH, CUMBERLAND
The mounds in the foreground of this U-shaped valley are formed of glacial debris
Photo - H. E. Taylor

fragmental, well bedded and strongly jointed rocks. The structure of the land eroded also affects the scenery. Where the strata are horizontal, the scenery produced will differ from places where they are inclined, folded into anticlines and synclines or intensely folded and faulted.

Features of Accumulation. The most striking features due to accumulation are the volcanic cones made of tuff (ashes) and lava such as Vesuvius, Etna and Stromboli or great

mountains such as the Alps, Carpathians or Himalaya. Although elevation is necessary to give opportunity for erosion, most of the natural features are produced by erosion of the elevated parts. A plateau soon becomes dissected by rivers which widen their valleys and eat back into the plateau until only hills of approximately equal height remain (e.g. Salisbury Plain). The Lake District of England is a good example of a high plateau which has been carved into a group of mountains. Mountain



CHARNWOOD FOREST; HANGING ROCKS, WOODHOUSE EAVES
Pre-Cambrian rocks, protruding through the Triassic rocks of Leicestershire

Photo: H. E. Taylor

basaltic plateaux such as Antrim and the Deccan. Other less striking but common accumulations of material are: (1) Glacial moraines, drumlins and boulder clays left behind by the retreat of the ice of the Ice Age. In the lowlands of Scotland and Northern Ireland there are large areas covered with drumlins, and much of eastern England is covered with boulder clay. (2) Sand dunes commonly occur along our coasts, and in the Sahara and central Asia they are sometimes surprisingly high. (3) Deposits of loess even cut a landscape until erosion takes place. (4) Flat tracks of alluvium are found along the valleys of great rivers and large deltas are sometimes produced at their mouths. (5) Sand spits and storm beaches, though small in themselves, may divert river mouths and sometimes cause lagoons.

Features due to uplift alone are not common. They may be coastal plains such as those of eastern Africa or the English Fens around the Wash, plateaux such as the basin between the Rocky Mountains and the Sierras, or folded

chains such as the Alps, Carpathians, Himalaya and Atlas owe their height to uplift and folding; but their rugged nature and their individual peaks are the results of erosion.

Valleys may be due to depression, as in the case of the Great Rift Valley of Africa and the rift between the Vosges Mountains and the Black Forest through which the Rhine flows. In these cases faults have let down a tract of land. Such valleys are rare. Usually valleys are due to erosion by glaciers and rivers aided by the effects of weather and gravity. Glacial valleys are usually U-shaped with steep sides and a broad flat bottom. River valleys when erosion is rapid are typically V-shaped. Gorges and canyons, however, occur when the river cuts through either horizontal or very resistant rocks and when the rate of river erosion exceeds greatly the rate of weathering. The Grand Canyon of the Colorado, 300 miles long and from 3000-5000 feet deep, has been cut by the river through the horizontal strata of a dry plateau where there is little weathering to wear away the sides and thus widen the valley.

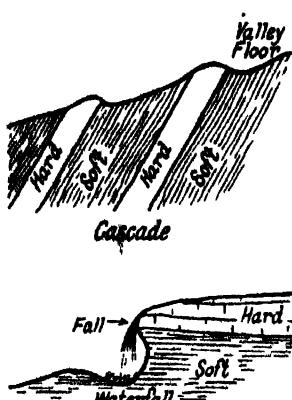
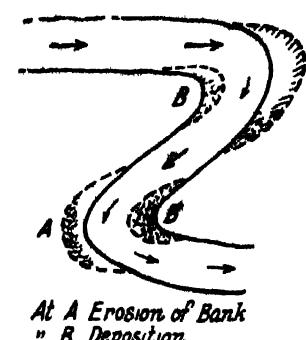
THE CRUST OF THE EARTH

55'

SYSTEM	MOVEMENTS AND CONDITIONS, ETC.	ROCKS FORMED	ESTIMATE OF YEARS
Quaternary	Holocene E. England sinking, W. rising.	Deposition in N. Sea and Bristol Channel of sands and muds. Beaches. Peat. Boulder clays (East Anglia). Drumlins (Ireland and Scotland).	Historical times
	Pleistocene Glacial Epoch. (Man appears on earth about this time.)		+ million
Tertiary	Pliocene Wealden anticline formed. Britain-land united to Europe. Time of great mountain building. (Himalaya, Alps, Atlas, etc.)	Deposition of shelly Cliffs of East Anglia.	
	Miocene Rhine Rift Valley formed.	No British deposits.	
	Oligocene		
	Eocene Fracturing of N.W. of old Europe.	Marine and fresh water sediments (Isle of Wight). Clays and sandstones of London and Hampshire basins deposited.	60 million
	Rising Land—Unconformity—Uppermost Cretaceous beds not deposited in Britain.		
Mesozoic (Secondary)	Cretaceous Subsidence.	No volcanoes.	120 million
	Jurassic Uplift in W. Wide strait across England	Wealden Lake in E. Deltaic conditions.	
	Triassic Land.	Desert conditions in places. Inland seas	
	Permian Pennines uplifted. Crushing of culm measures (Devon). Intrusion of granite (Devon and Cornwall). Deltaic conditions. Subsidence and deposition.	Volcanoes in Scotland.	180 million
Palaeozoic (Primary)	Carboniferous Devonian Britain above sea.	Coal, sands, and clays. Grits and sandstones. Mountain limestone with islands and coral reefs. Old Red Sandstone deposited in inland seas.	300 million
	Great northern continent, stretching to America.	Volcanoes in Highlands. Granite intrusions.	
	General rise. Caledonian uplift White Sea to Ireland, folding N.E.-S.W. direction. Highlands of Scotland uplifted again.	Limestones in S. Devon.	
	Silurian Ordovician Cambrian	Placid time of subsidence and deposition. Disturbed time of subsidence. Volcanic activity. Deposition.	
Precambrian		Volcanic activity.	
Archaezan	Very long break or unconformity. Archaean rocks buried, metamorphosed, folded into mountains, and worn away.	Limestones, shales, conglomerates, sandstones. Grits, shales, slates, flagstones. Volcanic ash (Cumberland, Snowdonia). Slates of Llanberis. Flagstones, greywacke (grit), in Wales. Sandstones in Scotland. Slates and flagstone, Longmynd.	600 million
	HIGHLANDS, Malverns, Anglesey.	Gneisses and schists.	Age of Earth 1600-3000 million

As rivers reach lower levels and erosion becomes less rapid the result of weathering becomes more apparent; the valleys become wider with meander slopes and tributary streams

are received. The river wanders from side to side in graceful curves, wearing away its banks on the outside of the bend and depositing gravel, sand or mud on the inner side. Lateral



the same direction as the slope of the valley, cascades will be formed, but if they run across the valley vertical falls over the edge of the hard layers will result. Waterfalls gradually recede up the valley as erosion of the hard layers takes place due to the under-cutting of the soft layers. The Niagara Falls have receded seven miles in this way and may eventually recede so far as to tap the waters of Lake Erie directly. Waterfalls may be formed by a tributary stream flowing in a hanging valley. Such falls are common in recently glaciated districts.

Scarp or Escarpments. Valleys tend to follow the line of least resistance and are more likely to be cut in soft than in hard rock where both are present. In this way the hard rocks are left to stand out as ridges or scarps. Scarps are especially common on the flanks of denuded anticlines. The North and South Downs are good examples. Other examples are the Cotswold Hills, Chiltern Hills, Wenlock Edge, and the mountain Cader Idris.

Streams sometimes cut across escarpments. This may be caused by the headwaters of a stream gradually cutting back until it taps the waters of another stream. It may be caused by the damming up of an old valley by a glacier, or a mass of glacial debris, thus causing the

erosion may now exceed excavation of the bed. Gradually the waters of neighbouring streams may eat back into the watershed, thus wearing it away. Sometimes the headwaters of one river are captured by the tributary of another. Ultimately the land is reduced to a base level of erosion or a peneplain.

Waterfalls and Cascades. When a young river passes over alternately hard and soft strata, waterfalls and cascades are likely to be produced.

If the strata lie in

stream to be diverted over some low portion of the escarpment for a sufficiently long period to enable it to cut a gorge through it. In other cases it may be that the elevation of the land took place so slowly that the stream was able to cut its way through the rock as quickly as it rose.

Dry Valleys. It is not uncommon to find valleys with no stream in them. In time a stream flowing over a limestone or other easily soluble rock may, by solution, widen the joints to such an extent that the water falls down the crack and makes its way along some bedding plane as an underground stream. In this way a portion of its old valley may be left dry. Dry valleys in chalk areas may have been formed at the end of the Ice Age, when there were large quantities of water from the melting snows capable of wearing valleys in chalk which was still frozen and therefore not porous.

Plains. Coastal plains may be produced by the uplift of new horizontal strata, or by the uplift of a plain of marine denudation. River plains are formed by long denudation, by deposition of alluvium on the sides of the valley, by the infilling of a lake with sediment, or by the formation of a delta at the mouth.

Deserts. The great deserts of the world are mainly situated in sub-tropical regions where rainfall is very slight. A glance at the map of the world shows that they are usually surrounded by mountains or high land, or are on the leeward side of mountains. The winds are, therefore, deprived of so much moisture that they are more ready to take up moisture from the soil than deposit any upon it. The chief features of deserts are the sand dunes, sometimes as high as 600 feet, hollows and valleys excavated by the wind, and mounds, produced by the few plants that can grow, which cause sand to collect around them through which they continue to grow upwards. Exposed hard rocks and stones are often polished by the wind-blown sand. Rocks of unequal hardness produce isolated columns, often undercut and etched by wind and sand into fantastic shapes. The hills of desert regions often have a roof-like shape as there is no running water to produce the familiar curves of our hills. Where local precipitation exceeds evaporation, but more often where underground water comes near enough to the surface, fertile spots, known as oases, occur. Deserts are often only deserts because of the lack of moisture; not because the rock debris could not support vegetation.

In some places the sands are black or reddish



GULLFOSS (THE GOLDEN FALLS), ICELAND
A waterfall gradually recedes up the valley as erosion of the hard layers takes place
Photo OI Magnusson, courtesy *Surveyor*

brown, due to manganese and iron oxide, which has been brought up in solution by capillarity, and left as a crust as the water evaporated. Deposits of salt occur in some deserts due to the evaporation of ancient lakes or inland seas. Salt Lake, Utah, is gradually evaporating and leaving great deposits of salt. In other places salts are brought to the surface by capillary action and left as encrustations

upon the surface, as in the Bad Lands of North America and in northern Chile. Some deserts are stony or rocky owing to the prevalence of strong winds which blow away the finer material.

Lakes. Lakes are hollows with a large volume of water, which may be either fresh or salt. They have been formed in a variety of ways. Many have been made by the formation

of barriers across river valleys. The Yellowstone Lake has a barrier of lava. In the Alpine districts large falls of rock and landslides have formed lakes. In the Lake District of England glacial debris has often formed the barrier.

Some lakes are found in rock basins, previously filled with decomposed rock or sediment, which have been cleaned out by glacial action. Many of the Scottish lakes and tarns were probably produced in this way. As the ice sheet retreated, after the Ice Age, it left large quantities of debris, which formed an uneven surface, in the hollows of which lakes were formed, as in Finland and North America.

Movement of the crust is not equal in amount in all places. Depressions are sometimes formed where water will collect (e.g. the Dead Sea and lakes in the rift valleys of Africa). The Caspian Sea and other salt lakes of central Asia were once parts of the ocean but have been cut off from it by uplift. Lake Rotorua in New Zealand was formed by subsidence in a volcanic area and Lake Rotomahana lies in a hollow caused by the eruption of Tarawera.

The solution of limestone, or salt, or gypsum, may produce hollows in which water can collect. Some of the lakes in Ireland are probably due to solution of the underlying limestone. Lakes are not very permanent features. Some become filled with sediment by streams—a delta is being formed by the Rhône in Lake Geneva. Some have their waters evaporated more rapidly than they receive fresh supplies, as Salt Lake, Utah, and the Dead Sea. Barrier lakes may have their barriers cut through by streams issuing from them, so that they become

drained. Uneven uplift of the land may tilt the lake so that its water drains away. The Great Lakes of America are being tilted by uplift on the Canadian side.

Coasts. Coasts are of two types, transverse and longitudinal. The transverse type, most frequent on the Atlantic seaboard, cuts across the grain of the land and is mainly due to faulting and subsidence. The character of the coast varies with the nature of the lands cut across. The longitudinal type, chiefly found on the Pacific and Mediterranean seaboards, is parallel to ranges of mountains and is consequently more uniform in character. Although the eastern coast of Asia runs parallel to the grain of the land subsidence has produced festoons of islands enclosing shallow seas.

The advance of the sea due to subsidence produces wide bays, where peneplains are submerged, as in the Bay of Biscay; and deeply indented coastlines with gulfs, fjords, firths, lochs, loughs and drowned estuaries, or rias, in highland districts, such as Iceland, Norway and Britain.

Where marine erosion is taking place the headlands are formed of hard rocks, while bays are cut in the softer ones. In hard rocks erosion takes place chiefly along bedding planes, faults and joints, but in soft rocks such planes have less effect. Caves and natural arches are formed along bedding planes, faults, and joints. Stacks are formed by erosion along joints. Cliffs on headlands are usually steeper than those in bays because in the bays weathering of the top of the cliff is often greater than the action of the sea upon the base.



PLAIN OF MARINE EROSION AT BUDÉ, CORNWALL

Folded Culm Measures planed off by waves and sand being deposited to form an unconformity

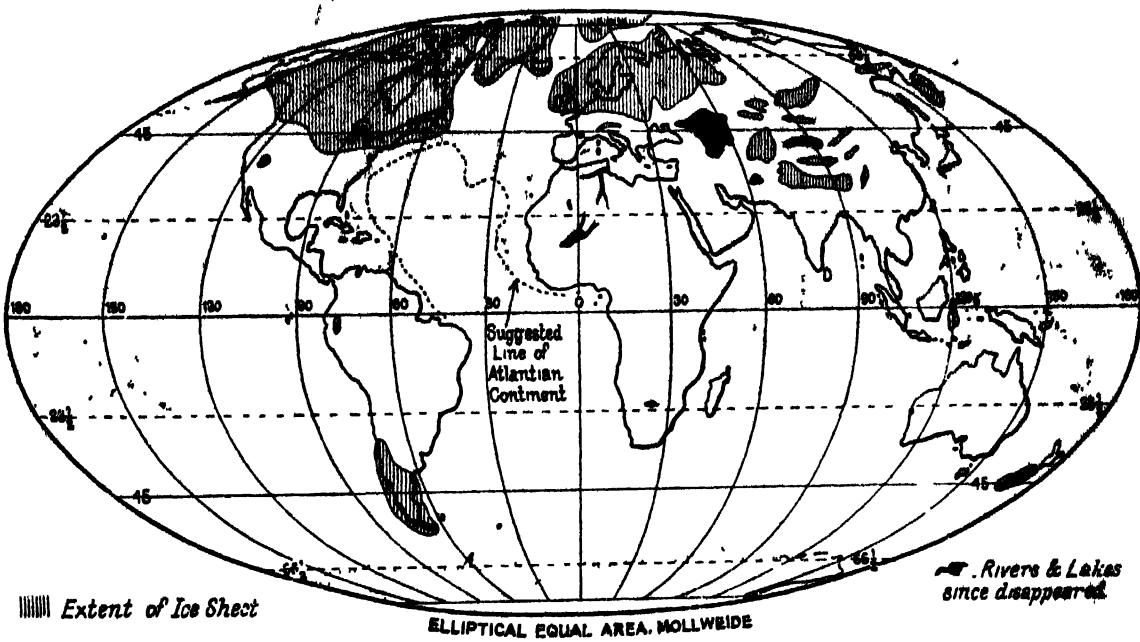
Photo: H. E. Taylor

Beaches tend to be absent where the rocks are hard or currents are strong, but to collect on sloping shores and in indentations of the coast. Currents and waves on the shore move sand and pebbles along the coast, hence beach material moves eastward along our southern shores and south along our eastern shores. Groynes are often used to prevent this movement in order that the accumulation of sand and pebbles may help to prevent further erosion of the coast.

Soils. Broken decomposed rock material mixed with animal and vegetable refuse forms soils. These may be formed directly from the underlying rock, when their nature will depend upon the chemical constituents of the rock and the amount of chemical alteration which has been brought about by its disintegration. The best soils are those which have been transported by river or glacial action for they will contain fragments formed from many kinds of rocks. The alluvial soils of great rivers and the glacial

drift soils of North America and Europe are, therefore, good for general agriculture. Limestone soils are shallow and often deficient in lime, as that has been carried downwards in solution. They form good pasture land for sheep (e.g. South Downs). Sandy soils are liable to suffer more than others from drought owing to their porosity and, if the sands are almost pure, they are often deficient in food material for plants. Many of our heaths and commons covered with bracken, gorse, bramble and hawthorn are sandy tracts which are difficult to bring under cultivation. Marls are useful for general cultivation. Clays form deep heavy soils suitable for wheat, root crops and dairy farming, but, if low-lying and poorly drained, may become water-logged and marshy and so unfit for cultivation.

Soils are usually thicker in valleys and lowlands than on the tops or slopes of hills, for all soils tend to creep gradually downwards.



The slow but powerful movements of the ice sheets wore down, smoothed and rounded the mountain tops, carved out deep rock basins and deepened existing valleys. The debris broken off was transported towards the sea, the heavier fragments being deposited on the way. Thus, when the ice melted, the debris left behind formed an uneven surface, in the hollows of which lakes were formed. When the ice retreated there was also a tendency for the land released from its weight to rise, the lift being greatest where the ice had been thickest.

GEOGRAPHY AND AVIATION

THERE is still a certain measure of surprise when our news bulletins inform us that the Prime Minister or Foreign Secretary has concluded some important conference in, say, New York, and makes a statement thereon in the House of Commons the next day. Nevertheless the increasing frequency of this rapid transportation of individuals is gradually familiarizing a wider public with the nature and possibilities of air travel; but many have yet to realize the extent to which an integrated network of air services already exists and the way in which this acceleration of movement has transformed our ideas of the accessibility of different parts of the globe. Development has been very much quickened by great advances made during the second World War

and few existing geographical works have up-to-date indications of the great changes in geographical values which have been brought about by the speed and range of modern air transport.

Our ideas of the relative position of points on the surface of the globe depend to a large extent on the time taken to reach any one place from the others; air transport has effectively telescoped many of these notions. Our geography has indeed become global, and with aircraft hops of 3000 miles a routine accomplishment, we are now beginning to think in terms of great circles giving the shortest distance and quickest time between any two places. The social and political repercussions of this mobility affect us all



FIG. 1. NORTHLAND AIRPORT FROM THE AIR

This London airport mainly handles traffic to and from European countries

Photo: B.O.A.C.



FIG. 2. THE STRATOCRUISER
A large modern transport and passenger plane made by the Boeing Aircraft Company, U.S.A.
Photo: Boeing Aircraft Company

intimately and a full appreciation of this has yet to be realized by the majority.

While aviation has in this and other ways an effect on geography, it is also true to say that geographical factors have a considerable influence on aviation. In the following pages both of these interrelated aspects will be considered, together with an outline of present world air routes and modern types of traffic.

How Geographical Factors Affect Aviation. The establishment and determination of air routes is largely dependent on a series of special considerations, the majority of which are geographical in nature. While it is true that great-circle routing underlies many of the major world air routes, it should perhaps be emphasized that in few cases is the great circle or shortest distance actually followed. In flight the aircraft is normally navigated on a compass course (a constant course being known to the sailor as a rhumb line or loxodrome) and this is slightly longer than the great-circle course. Only in some special forms of radio navigation is it possible to fly on the true great-circle route on which the compass is steadily altering the whole time. Furthermore, while the route planner may begin with the shortest distance between his terminals, he usually finds that deviations will be necessary or desirable according to the relative importance of the factors considered below.

ECONOMIC CONSIDERATIONS. One of the most important factors influencing the creation and maintenance of routes will be availability of traffic. This may take the form of passengers, mail, or freight of a special character and high value. The amount available will be mainly considered in relation to the terminal points of a route, but on occasions intermediate

stations which may be a little off the great-circle route will exert an influence and cause deviations. On very long routes refuelling will be necessary, and stops will be inevitable in any case. Thus on a sector of say 3000 miles which could be flown direct it might prove more convenient and profitable to call at a half-way station, which, although adding perhaps another 200 miles to the total distance flown and perhaps an hour to the time, might well double the operator's traffic and make the airline an economic proposition. A great number of stops may on the other hand be disadvantageous, as was shown on the pre-war British route to Australia. The Dutch competitors, K.L.M., by using faster aircraft and longer hops were able to get to Australia several days before British Imperial Airways.

While major air routes will naturally be based upon the main centres of population, it should not be overlooked that frequently good transport services between these centres may exist already. The airplane, however, will be able to offer a saving of time and convenience of travel to offset the increased cost. The cost factor will not, however, operate in areas where inaccessibility and remoteness have hindered the development of road, rail, and steamer services, and frequently we find well-established and good air services operating in, for instance, remote parts of Australia, Canada, and Russia. Nome, Alaska, for example, can now be reached in four hours by air from Fairbanks and for one-fifth of the cost of travelling overland, which, with a dog team, takes thirty days.

National standards of living will also influence the volume of air traffic which may be much increased by tourist traffic; thus, at the



FIG. 3. REFUELLED AN AIRCRAFT WHEN IN FLIGHT

The upper aircraft is the tanker and the lower the receiver. Petrol is conveyed from the tanker to the receiver at the rate of 100 gallons per minute.

Photo Charles E. Brown

moment, the greatest number of air travellers is in the United States.

TOPOGRAPHIC LIMITATIONS. It does not follow that physical factors and the terrain are no longer of consequence once the plane has left the ground, although it can fly equally well over land, sea, mountain, and plain. Deserts, oceans, jungle, mountains, and swamp may, if sufficiently large enough, present obstacles which must be circumvented. Of these obstacles ocean areas without islands constitute the biggest problem, for landplanes must cross them in one flight, and there is a limit, not only to the maximum flight distance the plane can undertake, but also to the economic flight distance, since increased petrol loads mean reduced cargo and passenger capacity. One result of this has been a sudden revaluation by the great powers of remote and often uninhabited oceanic islands which can now serve a useful purpose as refuelling bases—Midway and Wake in the Pacific, for instance. Mountains may cause diversions from ideal routes; the importance of really high ranges such as the Himalaya and Andes will be self-evident, and special equipment may be necessary to overcome them. Smaller ranges, however, may be circumvented by normal aircraft, e.g. the London-Rome route, which goes via Marseilles to avoid crossing the Alps.

THE WEATHER. The airplane is by no means yet independent of the weather, although many recent navigational aids are making flights commonplace nowadays that would

have been regarded as quite impossible twenty years ago. This is chiefly due to the application of radio and radar to flight navigation and the use of Ground Control Approach and Standard Radio Beam approach methods for bringing in aircraft. Initially, however, the siting of airports may well have been affected by meteorological considerations for, other things being equal, every effort will be made to avoid foggy sites and areas of highly variable winds (which involve duplicating runways). Once in the air the route followed is much affected by the weather: exceptionally bad conditions may be avoided by flying over or around the worst localities. Intermediate stops may have to be eliminated or modified. Thus, in the North Atlantic, in order to avoid the strong headwinds which blow from the west with almost continuous gale force in winter, and the icing conditions which accompany them, it is necessary to introduce high altitude operation, using air-conditioned and heated cabins and flying from terminal to terminal direct. Unfavourable local conditions in Ireland, Iceland, and Labrador could easily ground a plane for a lengthy period. The aircraft must also be pressurized; this is necessary when flying for more than half an hour at 10,000 feet and always when flying over 12,000 feet—heights which are by no means stratospheric.

One meteorological factor it is quite impossible to overcome. Aircraft move wholly within the air in which they fly and if the air, that is strong and adverse headwinds, is

moving against them, the speed will be correspondingly reduced. A flying speed of 250 m.p.h. becomes a relative 200 m.p.h. when encountering a headwind of 50 m.p.h., thus a journey of 2000 miles will take ten hours instead of eight hours, and extra petrol must be carried for the additional two hours' flight. This will reduce the potential load of passengers, cargo, and mail.

It will be obvious that with these factors in operation the route followed will frequently depart from the ideal great-circle route with which one may have originally planned the airway. Moreover, the route may well vary from day to day and from season to season. The London-New York route tends to go south in winter for climatological reasons.

AIR FACILITIES. There are two major considerations to bear in mind here. On the one hand the presence of adequate airports and their facilities will influence the detailed routing between terminal points, especially on long flights where stops become essential. A variety of aspects must be considered when choosing intermediate stations, ranging from the size of the airport, distance to the nearest town and considerations of transport thereto, radio and radar aids to navigation and landing, night landing facilities and adequate accommodation for staff and passengers. (See Fig. 1.) The size of the airport is most important, for this will determine the size of the largest plane which can land. In recent years there has been a tendency to build larger and larger aircraft, but it is now becoming evident that a limit must soon be placed or there will be very few

airfields capable of taking the giant airliners (Fig. 2). (The same problem has occurred with ship construction.) Many of the chief capital cities of Europe have airfields dating from earlier days which cannot now take even medium-sized aircraft.

The fuel range of the aircraft constitutes the second major limitation. A gallon of fuel weighs about seven pounds and may, on the average, carry the plane about a mile. About 1000 gallons hence represents some 7000 lb., which is the equivalent of about thirty-five passengers. It will be clear that the longer the flight the more petrol that must be carried, and hence the less the number of passengers. The economic flight range of the plane is thus very much different from the maximum aeronautical flight range which the plane could undertake if nothing but petrol were carried. The air route planner has to consider carefully how he can operate the aircraft to obtain from it the maximum economic utilization. It is almost impossible to say what the economic flight range is since this will vary from plane to plane; an upper limit is equally difficult to give, although a figure of 1500 miles is frequently noted. Actually, if the traffic warrants it and can stand the higher costs, through reduced passenger accommodation, this figure may be exceeded, as for example on the fast London-Sydney route where there is a hop of 3000 miles between Karachi and Singapore.

More recent developments such as jet propulsion, flying wings, and the possibilities of refuelling in the air (a plane can fly with a greater load than that with which it can take

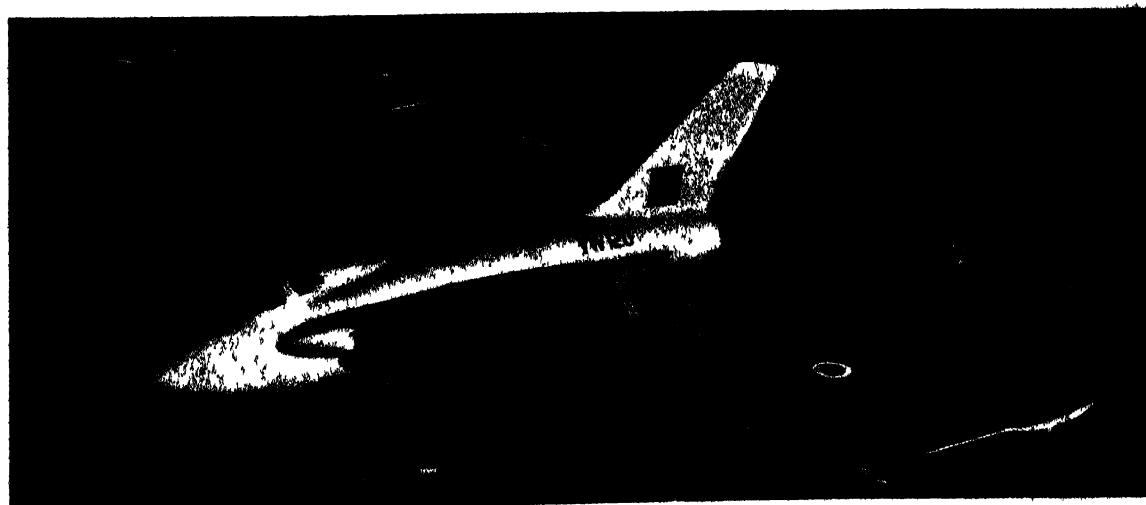


FIG. 4. A DE HAVILLAND JET PROPELLED "FLYING WING"
Photo: De Havilland Aircraft Co., Ltd.

off) may modify considerably current ideas of economic flight ranges. (See Figs. 3 and 4.)

POLITICAL ACTION. In addition to the purely economic and geographical factors detailed above it must not be overlooked that political considerations will frequently affect air ways and air routes. Action may be of two kinds, positive and negative. In the first and positive case we find governments establishing un-economic routes for reasons of national prestige, strategy, and military foresight; this is

Actually this factor is tending to become less important, for the increasing range of most aircraft renders by-passing more easy, and with few exceptions no nation can now adopt an effective blocking policy towards others.

While a complete freedom of the air has yet to be attained, many of the pre-war restrictions have been swept away and the chief remaining factor of influence now is the "cabotage" principle. By this a foreign carrier may not accept cargo and passengers between two towns within a state. Thus, on the British route London to Rome, passengers could not be picked up in Paris and conveyed to Marseilles. This means that the internal routes remain the preserve of the particular state.

International control is effected through the body known as the International Civil Aviation Organization (I.C.A.O.), which functions under the aegis of the United Nations and deals on a government level with problems as they arise. In addition, and for minor domestic relationships, the airline operating companies also have an association—the International Air Transport Association. Standardization of equipment and aids to navigation is, perhaps, one of the greatest problems now to be overcome, but much progress has been made at a series of post-war Commonwealth and International conferences dealing with radio and radar aids to navigation. A further aim is to open international airports in each country which will be available to all and equipped to internationally agreed standards.

GREAT CIRCLE AND RHUMB LINE. So much has been written on the more dramatic aspects of telescoped times and distances brought about by world-spanning aircraft that it is as well to clarify the relationship between great circles and rhumb lines. What might be termed the myth of great-circle flying has been responsible for much confused thinking in many quarters. Basically it is true that one can, in general terms, now think of great circle or shortest distances between any two points on the earth's surface. When it comes to the operation of air routes, however, it will be apparent from the foregoing indications of the importance of geographical, economic, and political factors, plus air facilities, that there will be many departures from the ideal great-circle route.

Furthermore, when in the air the plane is not always navigated on a great-circle course. From this point of view navigation techniques fall into two categories. On the one hand are the older well-established methods such as map



FIG. 5. THE NERVE CENTRE OF A MODERN AIRPORT

The compact control room of Rineanna Airport, Irish Republic, which handles much trans-oceanic traffic

Photo Topical

usually done by means of direct or indirect subsidies to the companies. Thus, in Britain the airline corporations in the immediate post-war period were being subsidized to the extent of nearly ten million pounds per annum so that certain essential political routes could be kept open.

Secondly, the action may be negative. In these cases permission to fly over certain territories or land at certain bases may be withheld. While a great measure of international agreement has been reached there are still some points to be clarified. Some nations would like a complete freedom of the air, but others wish to retain national sovereignty of the air over their country. Before 1939 the latter was more general and much hard bargaining preceded the opening of many routes. Italy, for instance, wanted high rates for aircraft flying over her territory, while Spain refused permission for British planes to cross to Portugal. More recently Pakistan refused permission for Dutch planes to land at Karachi because of differences of opinion about political conditions in the East Indies.

reading, dead reckoning, celestial and astronomical navigation, together with some more recent radio aids which assist in fixing position. In these methods the navigator works on a map and is dependent on a compass for direction. Since the compass direction on a great-circle route changes steadily as one moves along it, the navigator using the above methods has no option but to follow a rhumb line or line of constant bearing which will be slightly longer than the great circle. The route or particular section of the route may be planned as a great circle, but will subsequently be broken down into rhumb lines. (Fig. 6.)

In the second category, however, we do find certain rather specialized radio aids where the plane is flown on a great-circle course—as, for example, when navigating on a radio beam where the pilot will necessarily keep the plane on the great circle.

The actual difference between rhumb line and great circle is not so great as many think, however: from London to New York, for instance, it amounts to about 130 miles, or some 4 per cent of the distance flown. In actual practice this would be further reduced by travelling on, say, four rhumb lines approximating to the great-circle course.

Air Routes and Traffic. An extensive network of airlines now interlaces across the surface of the world and few major areas are remote from the main trunk or secondary feeder air routes. Some fifty nations are operating external air transport routes and nine of these have transatlantic services. Great Britain and the U.S.A. are foremost in these external air services but much competition is being provided by traditional trading countries such as Holland and France, together with comparative newcomers such as Argentine and Brazil. The total mileage of routes now operated throughout the world is of the order of 500,000 miles and Great Britain operates on approximately a quarter of this total. The significance of this network can perhaps be realized when one envisages the international organization necessary to maintain adequate landing facilities in some 200 different countries, colonies, and islands. The total number of passengers carried over these routes now exceeds twenty million per annum.

With most forms of transport such as road, rail, and canal, it is possible to prepare maps showing the definite routes followed by the different forms of transport, since such routes remain constant. Air routes, on the other

hand, are subject to considerable change. Only the airport sites can be regarded as constant and in theory an air route could exist between any two airports. The interlacing which results from showing all existing

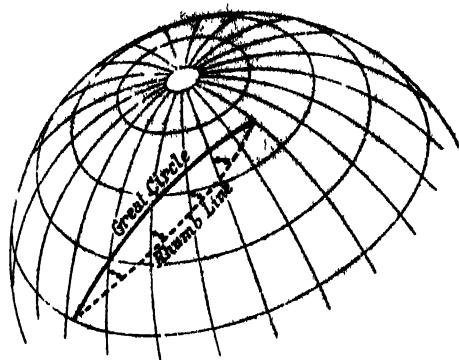


FIG. 6 GREAT CIRCLE AND RHUMB LINE

The great circle is the shortest distance between any two points on the sphere, but cuts the meridians at different angles. The rhumb line intersects the meridians at a constant angle but the line followed on the sphere is slightly longer than the great circle.

On the gnomonic projection great circles are shown by straight lines and on the normal Mercator projection rhumb lines are represented by straight lines.

air routes largely renders a small-scale map nugatory. The main routes can be indicated, but even here changes are frequent from year to year and for climatic reasons from season to season. Hence, for an up-to-date indication of the world airways system, it becomes necessary to refer to one of the *Air Guides* (e.g. Bradshaw), which reviews and corrects the changing position month by month.

THE DEVELOPMENT OF BRITISH COMMONWEALTH AIR ROUTES. While air connections with the Continent were early established after the first world war it was not until December of 1927 that Imperial Airways opened the way for the present wide network of air routes by starting a service between Cairo, Baghdad, and Basra. This was a connection between the mail boats, but it was from this small beginning that extensions were gradually made eastwards along the Persian Gulf to Karachi (after permission had been laboriously obtained from Persia) in 1929, and westwards over the Mediterranean to Italy. Then, from London, routes were opened to Basle, but owing to the Italian Government's refusal to permit British aircraft to enter the country from France, passengers had to travel from Basle to Genoa by rail, where flying boats picked them up again for Cairo via Rome, Naples, Athens, and Tobruk. The route varied from year to year

as experiments were made. Central European routes were tried in November, 1929, and Persia was by-passed in 1932. Longer hops were now becoming feasible, and finally the whole journey was possible in 1934 as a result of new agreements with France and Italy.

Meanwhile the route was being extended from Karachi with the aid of the Government of India. In June, 1933, it had reached Calcutta, and by October, 1933, Rangoon. Early in 1934 Singapore became the eastern terminus, and in this year Qantas Airways was formed in Australia to link Brisbane to Singapore. The first through plane to fly the entire route of 12,700 miles—half way round the world—left the United Kingdom on 13th April, 1935, and arrived in Brisbane twelve days later. Hong Kong was in 1936 next linked to Penang by way of Indo-China, while in 1937 New Zealand was reached and a new company, Tasman Empire Airways, emerged to operate the extension.

The story of the air route to South Africa is one of achievement in face of great odds and many disappointments. Airfields had to be hacked out of the African jungles and many experimental flights by landplane and seaplane were necessary. Cairo was used as the starting point and the service reached Lake Victoria by 1931, and by April, 1932, Capetown had been attained. In 1936 a trans-African route, Khartoum-Kano-Accra, was pioneered, and this link subsequently proved vital in the struggle for North Africa in the second world war.

An added impetus to the development of these services came with the introduction of the Empire air mail scheme, by which all first-class mail was carried by air, free of surcharge. An entirely new fleet of Short flying boats was ordered to undertake this

task and by 1938 something like 20,000 tons of mail a year were being carried by Imperial Airways and its associates—the largest scheme for the carriage of air mail in the world.

With the war of 1939 there came inevitable changes. British air services were amalgamated into one body and Imperial Airways passed into the British Overseas Airways Corporation. In spite of many difficulties B.O.A.C. maintained the Empire routes, although with many temporary and necessary divergences throughout the war. The Dominions were never cut off for long from the United Kingdom and new routes were frequently pioneered in places where no aircraft had hitherto flown. Wartime needs also accelerated the development of a new route now in constant use. In 1940 it was urgently necessary to ferry aircraft from the U.S.A. and Canada to the United Kingdom, and a return service was needed to take the aircrews back. In 1941 B.O.A.C. accepted responsibility for returning the aircrews, and by 1946 had completed some 2000 Atlantic crossings.

The end of the war has seen a certain amount of decentralization of B.O.A.C. and two new corporations were brought into being: British European Airways, formed in 1946, now undertakes all European services and flights within the United Kingdom; British South American Airways operated from 1947 to 1949 in order to develop routes to Latin America, the West Indies, and Mexico. B.O.A.C. now operate seventy-one services over forty-one routes and are carrying some 300,000 passengers a year. B.E.A., with a route mileage of 8000, reached the million passengers a year mark for the first time in 1951-2.

TYPES OF TRAFFIC. Air traffic can be divided into three categories: passenger, mail, and "typical air freight." Passenger and mail traffic are self-explanatory, but typical air freight needs elaboration. This is a convenient omnibus term which embraces all those classes of goods which, for various reasons, can stand the high cost of air transport. Normally this means that the articles will have a small bulk and high value, e.g. gold bullion, precious stones, etc., but often there will be special reasons to justify the transport by air of an extensive range of commodities varying from race-horses (which have flown the Atlantic) to ships' propeller shafts (flown to Cairo). Other cargoes include perishable tropical fruits and flowers, medicines urgently needed, samples, dresses, newsreels and newspapers.

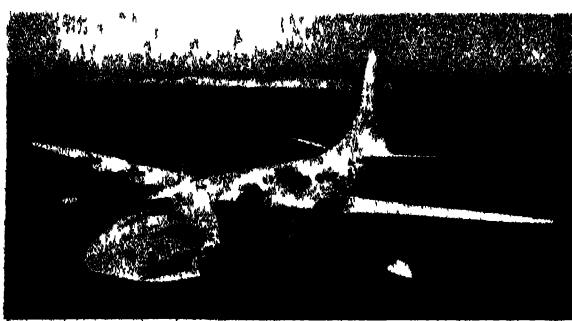


FIG. 7. A B.O.A.C. FLYING BOAT OF THE SOLENT CLASS LEAVING ENGLAND FOR AUSTRALIA.
Photo, B.O.A.C.

present cargo transport is not very important in air routes. In this respect air transport differs fundamentally from rail and water transport where the greatest revenues are derived from freight. With air the movement of passengers is the most important. Some idea of the exceptional value or character of air cargoes can be obtained from the cost of operating a four-engined aircraft from, say, London to New York. This is now about £3000 and the cargo that could be carried would be about three-and-a-half tons. It must further be remembered that cargo must make two profits, one for the aircraft operator and another for the merchant who sells at the destination; the air passenger has only to provide one profit for the airline operator. On some routes experiments are in progress with all cargo air liners, but until operating costs are much reduced it is not expected that any dramatic increase in the volume of cargo transported by air will occur. The present mixed conveyance of passengers, mail and cargo, will doubtless predominate in the immediate future.

Complete statistics of air traffic are somewhat difficult to compile owing to the large number of small operators. We may distinguish between scheduled and non-scheduled flights, and while the former are the most important the latter group also makes a large contribution. Actually non-scheduled or charter aircraft heavily outnumber the scheduled, but they will not normally be in such constant use as the scheduled. In the U.S.A., which now has over half the world's civil aircraft, there were in 1950 some 93,000 licensed civil planes; of this total only about a thousand were actually operating on scheduled routes, but even this small proportion was responsible for the conveyance of over seventeen million passengers. In the United Kingdom there were in 1950 some two hundred scheduled planes out of a total of two thousand registered civil aircraft.

Statistical comparisons are not easy when the size of the planes, distances, cargo capacities, etc., all vary, and in order to make such comparisons new concepts, such as passenger-miles flown, capacity-ton-miles, and the like have been introduced to assist assessment by taking into consideration the main variables.

Other Uses for Aircraft. While we have so far rather naturally stressed the importance of aircraft in the field of transport it should not be overlooked that a great variety of other uses are possible and frequent. Falling into the non-scheduled class, however, they are more

difficult to assess. The assignments vary from such diverse tasks as forest fire patrols, the collection of meteorological data, emergency medical services, to exploratory work. Aircraft have also been employed in crop dusting and

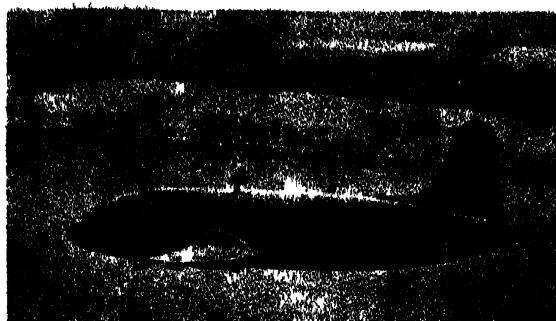


FIG. 8 A BRITISH EUROPEAN AIRWAYS VICKERS VIKING IN FLIGHT OFF THE COAST AT DOVER

These planes are mainly used on European routes

Photo: B.E.A.

crop spraying, and planes such as the helicopter have proved their value and worth in air-sea rescue work, the relief of lighthouses, and the conveyance of urgent mails. The future will probably see even more novel uses of aircraft.

Generally, however, among the category of other uses the most important is bound up with the great range of possibilities inherent in air photography. In war the interpretation of photographs taken from the air is a vital and most essential aid to military intelligence. It enables a watch to be kept on enemy activities which would otherwise be impossible. In peace the method can be used to supplement or accelerate ground work in a variety of specialized subjects. After a certain amount of correction for tilt and height distortion the photographs can be most useful in the preparation of maps for a given area. If maps exist, or have been made by air photography, a great variety of other information may be gleaned by accurate interpretation of the photographs. Land utilization surveys, for instance, can be undertaken much more rapidly than on the ground, where every field must be visited. Crop surveys can be made which would almost be impossible by normal methods; thus, during the war, the main rice crops in India were photographed, and by applying to the whole area sampling data, surpluses and deficiencies were computed in each zone and an equitable distribution planned. Air photographs can also provide information which it would be difficult, if not impossible, to obtain on the ground. Stocktaking

of forestry resources is one such example; timber volume can be assessed with an accuracy of 3-5 per cent, and in Canada timber is often bought and sold on data provided by air photographs. Geological data are often more easily obtained by the inspection of air photographs as the relationship of isolated features can be more easily appreciated, and variations of tone in the surface which are often due to geological changes are frequently more readily seen from the air than when on the ground. Further, when using a stereoscope one can study the morphology or form of the ground in relief.

In the U.S.A. the problem of land erosion and reclamation is being tackled with the aid of air photography. Farmers are being issued with mosaics of their lands showing what parts should be strip farmed, contour ploughed, farmed by normal practice, and so on. Vegetation and soil surveys and grazing problems in tropical countries could be undertaken in a similar way.

Engineering problems such as road and railway alignment, the routing of pylon lines for electrical schemes, irrigation works, reservoirs, etc., can also be more easily solved with the aid of photographs. The archaeologist, scientist, town planner, commercial advertiser and geographer, can also use air photography to great advantage.

How Aviation Influences Geography. A great variety of new maps has appeared during the last decade as a result of the growing realization of the increasing importance of aviation in human relationships. Many of these new maps and new ways of looking at the world are based on little-known map projections brought from the mathematician's study and now made to serve a useful purpose. Fundamentally the new maps arise from what is really an extension of an old problem. The earth has three dimensions and the map but two, and when the third dimension is squeezed out, distortion in some way becomes inevitable. The larger the area covered by the map the more the distortion: now the expanding horizon introduced by the airplane calls for maps covering larger areas until ultimately maps of the whole world on one sheet are needed. The problem of representing the sphere on the plane is then presented in its most acute form.

MAP PROJECTION. Four main properties of map projections may be distinguished: areas may be represented correctly; the shapes of small portions may be shown correctly (the projection is then said to be orthomorphic); azimuths or correct bearings may be preserved from the centre of the map; and scale variations may be reduced to a minimum and evenly distributed. The map may be

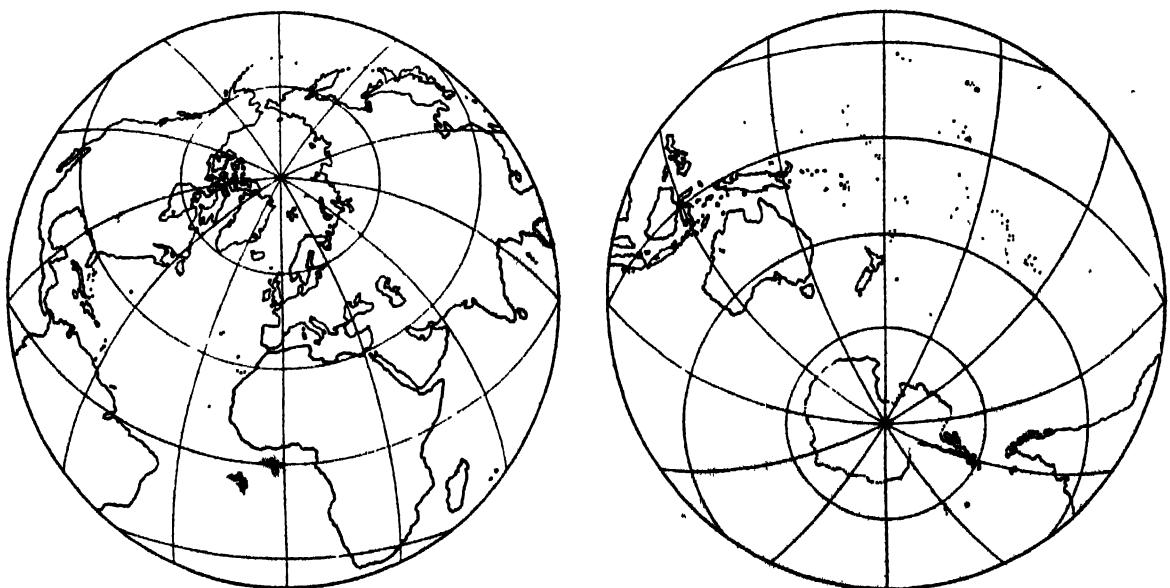


FIG. 9. THE WORLD ON AN OBLIQUE AZIMUTHAL EQUIDISTANT PROJECTION DEVELOPED IN TWO HEMISPHERES
Graticule interval of 30 degrees throughout

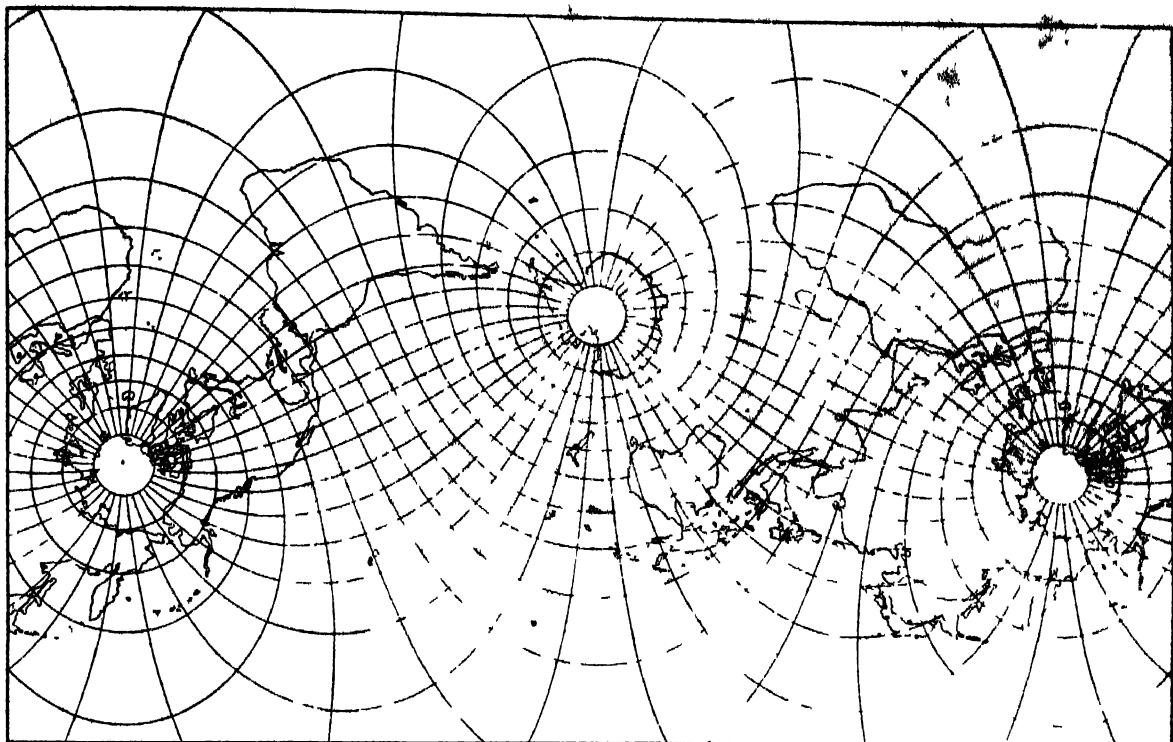


FIG. 10 THE WORLD ON AN OBLIQUE MERCATOR PROJECTION
Graticule interval of 10 degrees throughout

constructed so that one of these properties is maintained, and sometimes two. It will be clear from what has been said already that in dealing with air matters we shall be interested in the correct representation of distance as much as possible. The hitherto little-used oblique azimuthal equidistant projection, in which bearings and distances are correct from the centre, partly solves our problem, but when developed for the whole world there is great distortion of shapes of lands on the periphery. However, the world can be represented in two hemispheres, which can be "geared" to enable one to proceed from one hemisphere to the other (Fig. 9). The picture of the world given by the whole azimuthal equidistant is, perhaps, a little strange to many people who have been brought up on Mercator, but the distortion is actually little greater and so far as the aviator is concerned this is how he would view the space relationships of the lands and oceans from any given centre. The one difficulty is that a new map is necessary for each major centre.

A variety of other projections has been proposed for world representations, such as geared stereographic hemispheres and also the oblique

Mercator, of which an example is given (Fig. 10). For smaller areas the more conventional projections used on topographic maps may suffice for practical purposes (e.g. the polyconic and Lambert conformal), but in teaching junior audiences there is much to recommend the perspective orthographic since the suggestion of sphericity is retained, and one has the impression of looking down on a part of the earth (Fig. 11).

NEW GLOBES. The only representation of the whole or part of the earth which can be correct in all the properties listed above is, of course, a scale model in the shape of a globe. It would, in fact, be highly desirable for most of us to possess a greater familiarity with the globe than we now have; for only by much study and handling of a globe can the misconceptions and distortions inevitable in maps be fully realized and the necessary allowances made. It is interesting to reflect that in the present period we are returning to the practices of the seventeenth and eighteenth centuries, when instruction in the globe formed an essential part of a young gentleman's education.

The impact of aviation, however, has produced a variety of new ideas about globes. In

the first place the conventional system of mounting the globe on a polar axis has been abandoned in favour of the rolling or free globe which rests on ball bearings in a cup-shaped holder and can be rotated into any position at will. It can also be lifted out for



FIG. 11. THE GLOBAL IMPRESSION OBTAINED WITH THE USE OF THE ORTHOGRAPHIC PROJECTION

examination. The free globe enables the correct space relationships of more distant places relative to any one given point on the earth's surface to be studied with ease. It also avoids giving the impression that the earth is somehow fixed in space on the polar axis and that it possesses a top and bottom. The fixed type is, of course, desirable for demonstrating astronomical data such as night and day and the seasons, but apart from this there is little merit in mounting the globe on the polar axis.

To emphasize the way in which frontiers are outmoded with such rapid means of transport, some globes have been produced without frontiers being demarcated thereon. This idea has been carried farther by some who have produced globes leaving off all frontiers, mountains, seas, and oceans, and only showing the location of cities. Such a globe is of debatable value, but it does serve to bring out the way in which conventional geographical barriers have to a large extent been removed.

Despite the manifest advantages of using globes, they suffer from obvious weaknesses—the globe is cumbersome, cannot be transferred to the pages of a book and only half can be

viewed at any one moment, and of the half that can be seen the marginal areas are much foreshortened and appear distorted. In recent years a variety of "solutions" has been proposed in an effort to overcome these defects and combine some of the best qualities of maps and globes. The suggestions, which can be termed near globes, are really interrupted projections which may be built up into a shape resembling the sphere. As an example from Great Britain we may cite the Olympic World Map (E. G. R. Taylor and E. M. J. Campbell), and from the U.S.A. there comes the Likaglobe (Irving Fisher) and the Dymaxion Globe (R. Buckminster Fuller).

CHANGING GEOGRAPHICAL VALUES. It is perhaps not sufficiently realized that the importance of geographical factors changes from age to age. The geographical factor is dynamic rather than static and its relation to human affairs differs according to historical conditions. There can be little doubt that the world-spanning airplane capable of ignoring mountain, ocean, land, and desert, is creating a new set of what we may term space relationships, completely different from any of the past. With a speed of only 300 miles an hour the antipodes of any point on the earth's surface is a mere forty flying hours away. The modern Jules Verne can indeed circumnavigate the world in eighty hours instead of eighty days.

Looking back over the centuries we can see how the importance of distance has altered from time to time and the strategic and political implications that follow from these alterations. A thousand years B.C. the known world was confined to the Mediterranean and expressed cartographically as a flat disc surrounded by an ocean river. Improvements in knowledge followed with the Greeks and Phoenicians, but it was not until the Roman Empire arose that a dramatic change took place and this was largely because of the improvements in transport which followed from the hard, surfaced roads that were built. Cultures have always tended to expand outwards until communications between the centre and the periphery could no longer be maintained. The Roman road greatly extended the area which could be dominated from one centre.

During and after the Great Age of Discovery the sailing ship produced a further major change and enabled West European cultures to spread and hold coastal areas throughout

the world. Distances were still great, but the disc concept was by then discarded; the new approach was not yet global, however. Men-tally men now began to live on a cylinder which was expressed most commonly by the Mercator projection on which the land areas were divided into western and eastern hemispheres separated by oceans, with the unexplored and unknown polar areas forming the northern and southern edges. During this era sailing routes were important and the control of outlying islands much sought after. The introduction of steam-driven ships produced a further recasting of certain values because near great-circle routes were now possible and some island bases grew in importance while others declined. The Suez and Panama canals were cut, and by this time the cylinder concept was on its way out.

Ships, however, could not penetrate to the hearts of the continents and while road and rail transport began to perform this function in the late nineteenth century it was not until the twentieth century that the airplane, with its three-dimensional accessibility, confined to neither land nor sea, both maritime and continental, completed the process and created a new world outlook which is essentially global.

Strategically, air power now vies with sea power for predominance; with greatly increased air ranges it is becoming more significant and is creating new concepts in strategic and political geography. Air bases are now all-important; greater areas can be commanded from one base and more swiftly than with any other form of power such as has been known in the past.

With this increased mobility and reduction of time-distance, however, come new responsibilities. In the past, with slower transport and great intervening spaces, cultures clashed less frequently and less disastrously. Aircraft, aided by radio communication, has reduced our world to small dimensions and made near neighbours of us all. A reorientation of outlook will be necessary for many people if culture clash is to be avoided in the future.

NEW OUTLOOKS. With all these changes and implications it becomes necessary to recast many of our conventional attitudes and to reorientate our ideas to conform with the changed situation. First and foremost one must, perhaps, emphasize the need for a global approach to world problems. Politically it seems we are moving towards larger units—the chequerboard patchwork quilt of European

boundaries can be crossed in two or three hours by the long-distance air liner. A gathering of individual units into regional groupings would seem a likely concomitant of the conquest of the air.

Considered globally we note, too, that much of the world that matters falls into a single hemisphere which is roughly centred in Western Europe. Only Australia, Antarctica and the southern tip of South America are outside. Within this land hemisphere we find 94 per cent of the world's population and 98 per cent of the world's industry. The other half is, of course, mainly oceanic. It is in the principal or land hemisphere that the major part of economic, political, and social activity takes place, and it is here that air transport will be of significance.

It may be noted further that the hub of this hemisphere lies in Western Europe. This means that the flight distance from Western Europe to other principal trading regions is less than the distances between most peripheral trading areas. These will have heavier costs to carry as a result. The nodality of Western Europe suggests that some one station is destined to become an international airport of world significance. London Airport may well play this role in the future. It is the first land-fall after leaving the North American continent and the last from Europe. A world-spanning airliner operating on 2000 mile legs would not

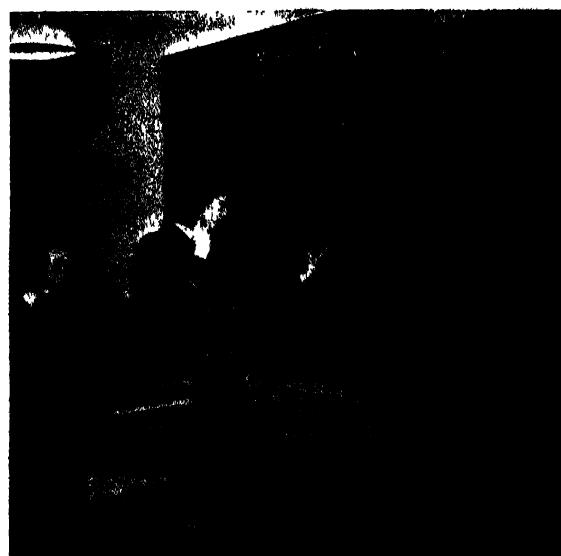


FIG. 12. AIR TRAFFIC CLERKS CHECKING AIRCRAFT IN AND OUT AT NORTHOLT AIRPORT, LONDON

The detailed movements of a large number of planes are recorded day by day

Photo: Topical

proceed to make a series of stops in Western Europe, but would operate from one major European airport, where it would either leave passengers and cargo to be distributed by internal services or pick them up after they had been collected by the internal services.

One should also consider the distribution of population as well as that of land. The major airways of the world will naturally pass through, or near to, the areas of concentrated population, especially capital cities, since key personnel (statesmen, business men, scientists, etc.) will naturally favour time-saving methods of transport. There are some forty-four conurbations with over a million people in each and it is very interesting to note that the greatest number are located near a great circle which roughly passes through London and Melbourne. It is in this zone that we find the greatest development of air routes. The conurbations also have a centre of gravity which falls in Western Europe, which again on this analysis occupies a nodal position.

Two areas will be of little importance. The Pacific Ocean does not figure among the major routes for the simple reason that the shortest flight path between the major trading areas in the principal hemisphere does not leave that hemisphere. The North Polar area (contrary to current impressions) has little significance, as few routes go north of the Arctic Circle. This area lies off the great-circle strip defined as containing the world's conurbations, and airway routes hence by-pass the region.

Air transport also accentuates the two aspects of distance. Geometrically, distance may be fixed and static, but geographically it can be measured in terms of time and cost. It is in the field of time-distance that aviation has had such a great effect; now that the North Atlantic can be crossed in a matter of hours, geometrical distances and proximity factors are much modified when one thinks in terms of time. Air transport has yet to react fully on cost-distance, however, which is the dominant consideration in economic geography. Here the longest way round may be the cheapest, as the movement of bulk commodities such as wheat, coal, and oil, frequently shows. How far special

cargo air liners will modify future concepts of cost-distance remains to be seen.

Inaccessibility can no longer be given as a reason for lack of development in any region. Many instances have by now occurred of industries arising in remote areas with only air transport as the link with the outside world. The gold mining of New Guinea (where all the machinery was flown in) is such an example. In Northern Canada and Central America, too, special air companies enable local industries to find an outlet to international markets.

It is clear that with the advent of what some have called the "Air Age" we must be prepared to sweep away many of the geographical misconceptions arising from the far too extensive use of Mercator maps of the world. This projection was really designed for the navigation of ships, and its almost universal adoption as a general world map has coloured our thinking for too long. Most ideas of distance, times, areas, and space relationships obtained from it without cross-checking with a globe are erroneous.

In conclusion, the question may well be asked, "And how does aviation really affect the average person?" As a potential air passenger the immediate possibilities are perhaps small, but indirectly as a member of the community the influence is great. It is not so much the fact that a plane *can* reach any part of the globe from any other spot in less than two days, but rather that regular scheduled passenger and cargo air services *are* taking people and goods every day to and fro between the world's main centres of population and trade. These regular routes provide rapid and easy contacts for business executives, scientists and politicians, with a consequent speeding up of business and political life. The decisions made by these key men will affect the activities of countless human beings.

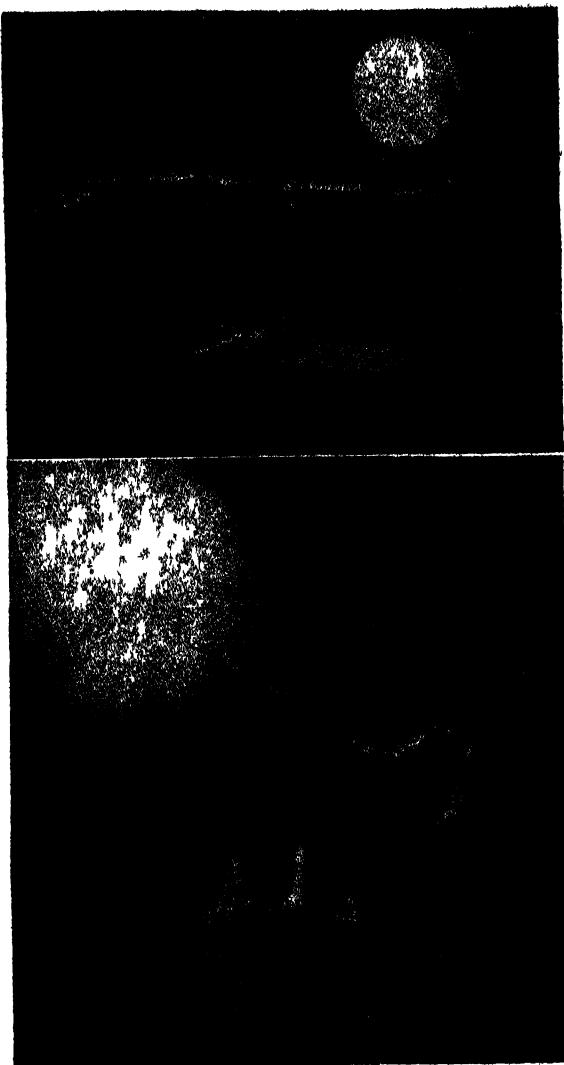
These rapid means of contact give a new conception of geography and the reduction of time-distances makes near neighbours of us all. If aviation can be used in the proper manner it will bring immeasurable benefits to the peoples of the world.

CLIMATE AND WEATHER

THE climate of a place is defined as the annual mean of its weather. It is in the nature of weather conditions to change from day to day, from season to season. Climate is the sum total of all these changes which will be considered in relation to the effects which they produce on human life. Precipitation (rain, sleet or snow), unprecipitated moisture in the atmosphere (fog, cloud or mist), wind and temperature, are the principal factors of weather conditions and, therefore, of climate.

The relation between rainfall and temperature on the one hand and vegetation and wealth derived from the land on the other is clearly marked; the direct influence of climate on human activity, particularly in relation to output of energy, is also well established. Historically, climate, and in particular marked changes of climate, have greatly influenced civilization. The physical causes which in turn determine climate are varied and complex and include latitude or distance from the Equator; altitude or height above sea-level; the position of a place in relation to land or sea (as evidenced by the great difference between continental and oceanic climates); and a large number of local conditions among which position in relation to mountain ranges is of first importance. The precise nature of the relation between these influences and temperature is known, but the underlying causes of variations in rainfall and winds, which themselves are dependent on pressure distribution over the face of the world, have only partially been discovered, whilst the exact nature of even the most common of weather determining factors in temperate latitudes, the cyclone or low pressure area, is still a matter of much doubt.

Temperature. The immediate cause of heat, of light, is the Sun; more precisely, the Sun heats the Earth which in turn warms the atmosphere, the latter acting as a blanket which at once cools the Earth during the time



THE DATA OF METEOROLOGY

Above: Releasing a pilot balloon to measure the wind aloft. The small rubber balloon, filled with hydrogen, rises rapidly through the air and at the same time drifts with the wind. By using a theodolite (seen on the left) to track the balloon the winds can be measured. The results are computed on the special slide-rule seen in the picture. Below: Radio-sonde for measuring the pressure, temperature and humidity at great heights. The balloon carries up a miniature radio transmitter which automatically signals the data in the form of musical notes.

Reproduced from "Your Weather Service" by permission of the Controller of H M Stationery Office

GEOGRAPHY AND MAN

PLOTTING SYMBOLS FOR PRESENT WEATHER													
		=			(R)		≡			* *			
CLOUDS GENERALLY DEVELOPING DURING PAST HOUR	DRY HAZE	MIST	LIGHTNING VISIBLE. NO THUNDER HEARD	THUNDER HEARD, NO PRECIPITATION	PRECIPITATION	HEARD	OBSCURED	FOG, SKY	HEAVY CONTINUOUS RAIN	HEAVY CONTINUOUS FALL OF SNOW	SLIGHT SHOWERS OF RAIN AND SNOW		
PLOTTING SYMBOLS FOR TOTAL AMOUNT OF CLOUD (IN OKTAS, OR ONE EIGHTH OF SKY COVERED)													
									SKY COMPLETED COVERED	SKY OBSCURED OR CLOUD AMOUNT CANNOT BE ESTIMATED DUE TO DARKNESS			
PLOTTING SYMBOLS FOR FORM OF LOW CLOUD													
									CUMULUS WITH LITTLE VERTICAL DEVELOPMENT				
CUMULUS OF CONSIDERABLE DEVELOPMENT			CUMULONIMBUS WITH TOPS LACKING CLEAR-CUT OUTLINES			STRATO- CUMULUS FORMED BY SPREADING OUT OF CUMULUS			STRATO- CUMULUS NOT FORMED BY SPREADING OUT OF CUMULUS				
STRATOCUMULUS OR BOTH, BUT NOT FRACOSTRATUS OF BAD WEATHER			STRATUS OR FRACOSTRATUS OR BOTH, BUT NOT FRACOSTRATUS OF BAD WEATHER			FRACOSTRATUS AND/OR FRACOTOCUMULUS OF BAD WEATHER			CUMULUS AND STRATOCUMULUS OTHER THAN THOSE FORMED BY THE SPREAD OUT OF CUMULUS				
CUMULONIMBUS HAVING A CLEARLY FIBROUS (CIRRIFORM) TOP, OFTEN ANVIL- SHAPED, WITH OR WITHOUT CUMULUS STRATOCUMULUS, STRATUS OR SCUD													
CODE FOR CHARACTERISTIC BAROMETRIC TENDENCY PRINTED IN RED ON OFFICIAL CHARTS													
								BAROMETER NOW HIGHER THAN OR THE SAME AS 3 HOURS AGO			BAROMETER NOW LOWER THAN 3 HOURS AGO		

WEATHER SYMBOLS

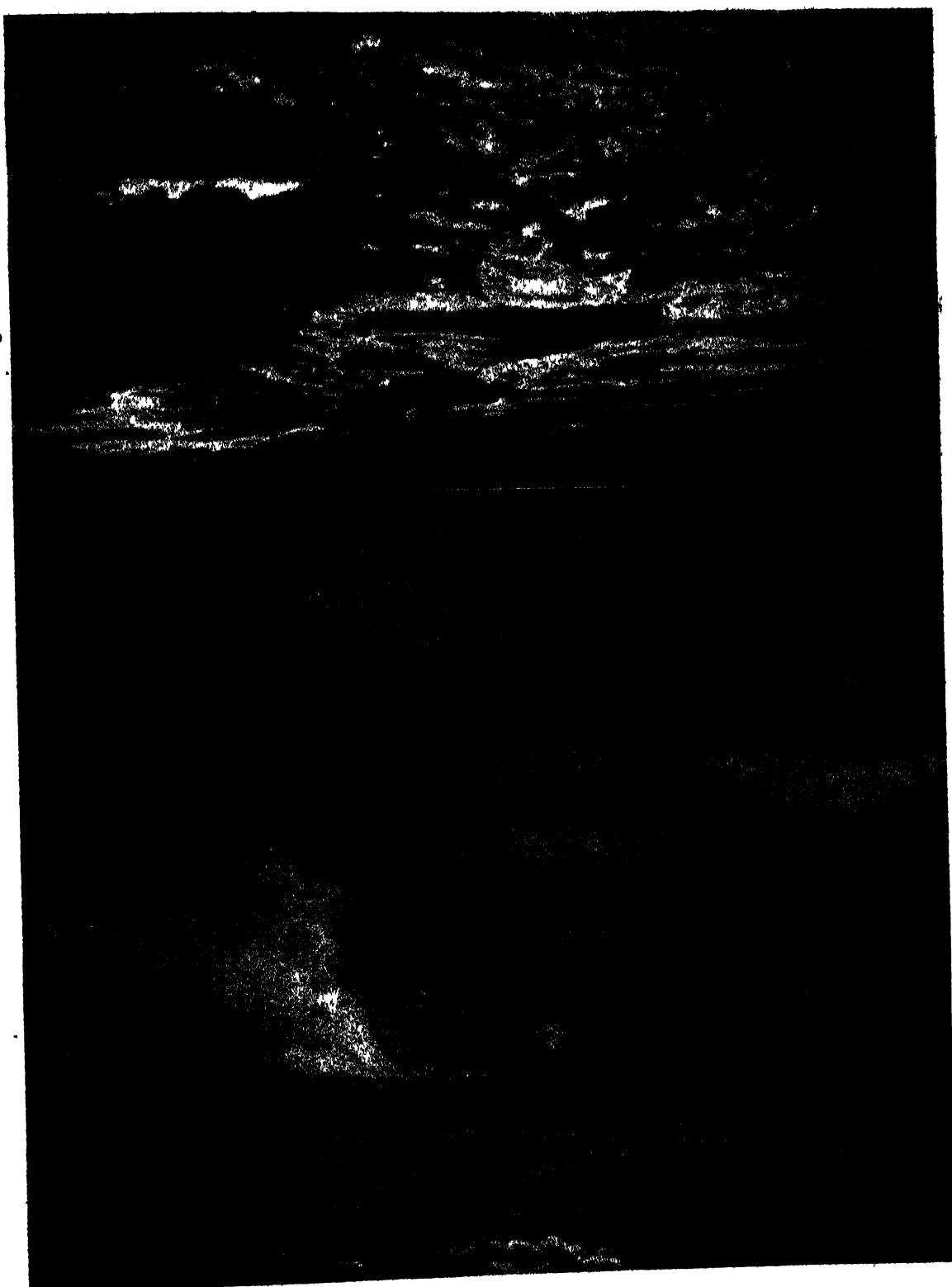
A plan showing the use and meanings of representative signs according to approved international practice
Abstracted from "Handbook of Weather Messages, Codes and Specifications" by permission of the Controller of H.M. Stationery Office

that the Sun's rays are falling on the Earth and maintains its warmth during the hours of darkness. If there were no atmosphere the Sun's rays falling directly on the Earth's surface would heat it to an extent at which life would be impossible, whereas when the Sun's rays were withdrawn, the Earth would radiate its heat with enormous speed and fall in a few hours to a temperature lower than that at which life can be sustained.

The greater the moisture content of the atmosphere at any given place the greater its dampening effect on the Sun's activity and the greater the tendency to an unchanging temperature by day and night. Clouds (which consist of unprecipitated droplets of water condensed by cooling from moisture of the atmosphere) are the normal visible signs of this tendency; they temper the heat of the day and normally in temperate latitudes preclude frost at night, thus making for a uniformity of

day and night temperature. Thus Alexandria which is one of the sunniest places in the world has a much greater range of temperature than Athenai (Athens) where heavy clouds are relatively frequent.

Since atmosphere has a modifying action on the insolation received at any given spot on the Earth's surface it follows that the more nearly vertical the rays of the Sun, the warmer they will be, because they will have traversed a lesser thickness of atmosphere than if they had fallen more obliquely. Hence it is obvious that, apart from other elements, that part of the Earth's surface will be warmest where the Sun is vertical at noon, i.e. at the Equator in March and September and at the Tropics of Cancer and Capricorn in June and December respectively, this variation being due to the seasonal change in the inclination of the Earth's axis to the Sun, and, conversely, that the coldest part of the Earth's surface will be where the



CLOUD FORMATIONS

Above: Broken alto cumulus typical of winter anti-cyclones. *Below.* The turbulent upper surface of a stratus layer photographed from an aeroplane at a height of 11,000 feet just after sunrise. A layer of cirrus more than 25,000 feet high is also visible

Photos - Keystone; Planet



A STORM CLOUD

A storm cloud formation showing the white cumulus cloud above with the darker nimbus forming on the lower fringe

Photo: Central

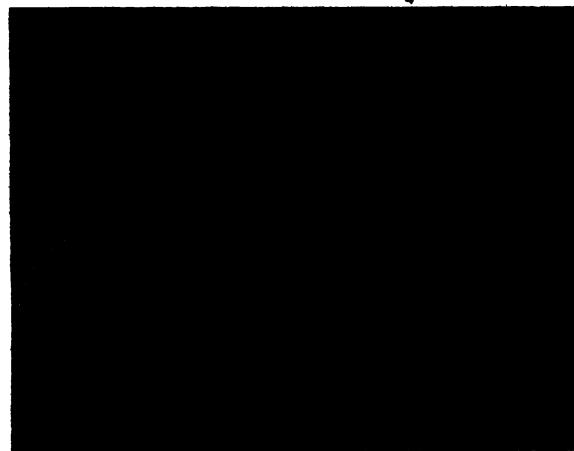
rays of the Sun fall most obliquely, i.e. at the Poles.

If the face of the Earth were a homogeneous mass either of land or of a constant altitude or of water of a constant depth, these conditions would be fulfilled and mean annual temperature would decline steadily from the Tropics to the polar regions. North and south of the Tropics of Cancer and Capricorn the daily period of insolation increases in summer and decreases in winter, so that when the Pole is reached there is continuous insolation for six months of the year and none at all for the other six. Allowance being made for this fact, the effect would be that there would be little seasonal variation of temperature in equatorial regions, and greater seasonal variation the farther north or south that readings were taken. In practice it is found that, owing to other modifying influences, the greatest range of temperature occurs in continental areas outside polar regions, but that added insolation does often outweigh the greater strength of the vertical rays of the Sun, and that the highest maximum temperatures are received outside the Tropics, rising, for instance, to 130–140 degrees Fahrenheit in the shade in northern Africa. But though such discrepancies were allowed for on a homogeneous Earth, mean annual temperature might still be expected to decrease gradually north and south from the Tropics.

Maritime and Continental Climates. It will be seen, however, from a map showing isotherms (imaginary lines joining places having an equal mean temperature, see p. 81) that the isotherms by no means follow the lines of latitude. It remains, therefore, to consider the influences which modify the effects of latitude. The most important of these is the distance of a place from the nearest open sea. Generally it may be said that islands near the centres of

oceans, which thus approximate most closely to true maritime conditions, have a marked tendency to an equable climate, whilst places near the centre of land masses show great extremes of heat and cold, with a wide diurnal range typical of a continental climate. Coastal or littoral climates share in both according to the direction of the wind, those blowing from the sea producing conditions typical of the maritime climate, and those blowing off land of the continental climate. The reason for this discrepancy has been found in the enormous difference between the power of land and water respectively to absorb and radiate the heat of the Sun.

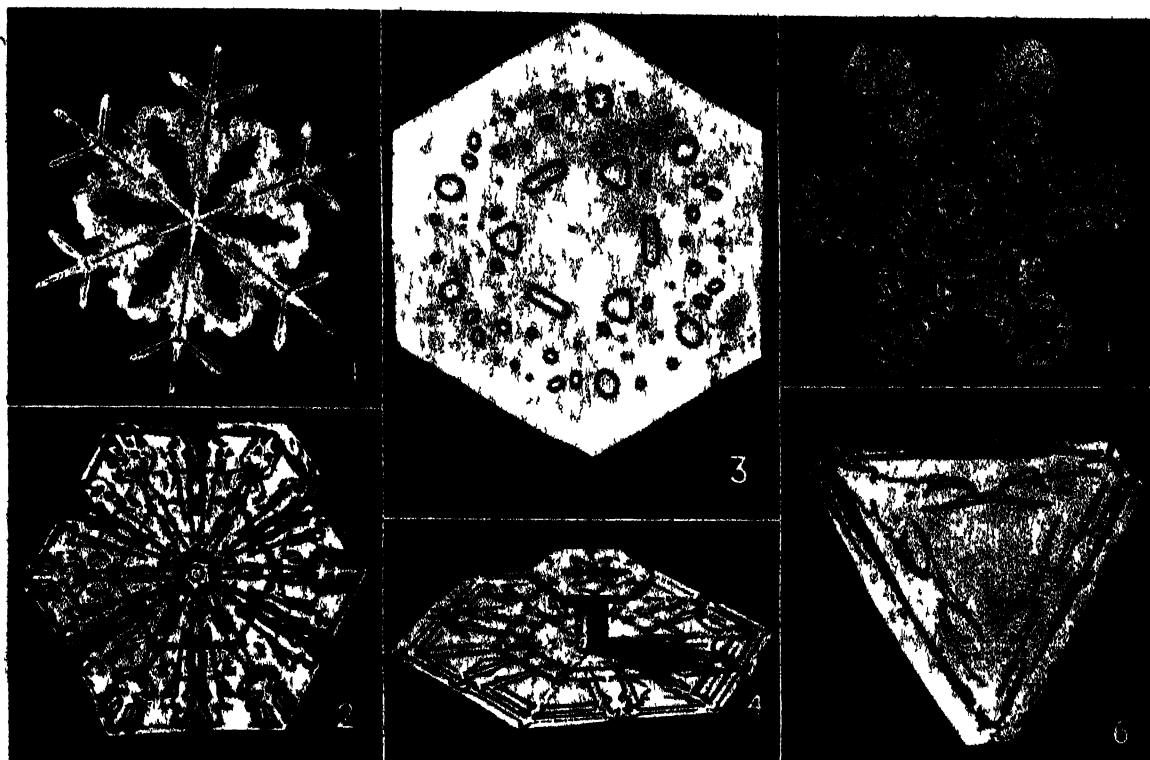
In general, land both radiates and absorbs heat more rapidly than water. The deeper the water and the wider the extent of the ocean the more slowly does it carry out these processes. The reason for this is threefold. First, the particles of water are in a constant state of movement horizontally and vertically, so that heat absorbed by the surface layers is immediately dispersed through the whole body. Land, on the other hand, stores its heat in the surface layers only. Secondly, whereas land is opaque to heat rays and acts in much the same way as a radiator reflecting the heat into the atmosphere, water receives the heat rays to some depth owing to its comparative transparency. Thirdly, it requires a much greater amount of heat to raise a given mass of water one degree than it does to raise an equal mass of land to the same amount. The result of these influences is that the oceans act as permanent reservoirs of warmth in the cold seasons and of cold in the warm seasons.



THE AURORA BOREALIS

The result of a magnetic storm many miles above the surface of the Earth, photographed at Tromsø, Norway

Photo: Wide World



FORMS OF SNOW FLAKE

Unique microscopic photographs showing a few of the typical forms of snow flakes of which numbers 2, 3, 4, and 6 were exposed by Mr. Wilson Bentley, the famous meteorologist whose work in photographing snow in the Vermont Mountains, U.S.A. is regarded as outstanding.

Photos Planet, Topical

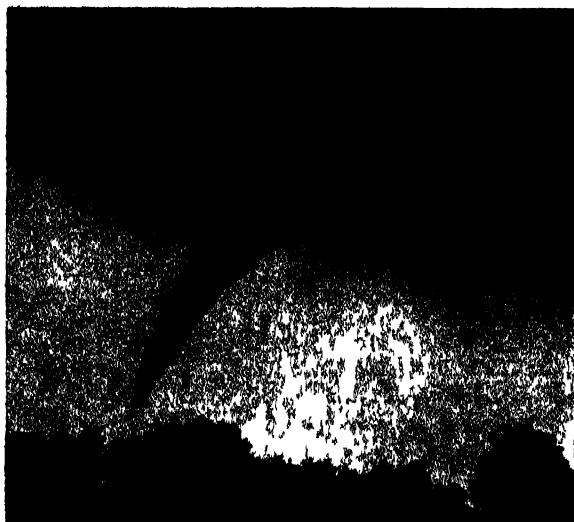
A further important influence in determining maritime climate is the existence of currents in the oceans which convey water from a lower or higher latitude without materially affecting the temperature of the current. The two most signal examples of this in the Northern Hemisphere are the Gulf Stream and the Labrador Current. The former flows from the Gulf of Mexico and carries a great mass of relatively warm water northward and eastward across the North Atlantic, thus raising abnormally the temperature of that part of the ocean and correspondingly increasing the warmth of the winds which circulate over it. By contrast, a cold current flows southward from the Arctic regions along the eastern seaboard of Canada and gives to the Canadian coast an abnormally low temperature, with the result that ports on the Canadian coast in the same line of latitude as the Orkney and Shetland Islands are ice-bound during part of the winter, whereas ice never descends south as far as the latter.

The effect of altitude is given by the general statement that, on the average, temperature decreases one degree in every three hundred feet, but this decrease is not constant, being

greater during the day than during the night and during the summer than during the winter. This follows from the fact that the layer of the atmosphere in immediate contact with the Earth is heated first; as this layer becomes heated it expands and rises, but, in doing so, loses some of its heat. Conversely, when the Earth is radiating its heat the lowest layers of the atmosphere must cool before the upper; but cold air contracts and therefore does not rise, with the consequence that on a clear night some layers of the atmosphere actually remain warmer than that immediately in contact with the Earth, giving what is termed an inversion. When the moisture content of this lowest layer is great a layer of stratus cloud in the form of fog is produced, thus intensifying and maintaining the inversion. It follows, therefore, that though mean temperature decreases with altitude, constancy in diurnal and annual range of temperature increases. Thus Quito, in the Andes, the highest capital city in the world, has a perpetual climate very similar to that of an English April in spite of the fact that the line of the Equator passes only a few miles from it.

Pressure Distribution. Purely local conditions may affect temperature through the agency of forming cloud, changing wind speed and direction, and in other ways, but these factors and, in addition, the amount of rainfall, are chiefly influenced by the distribution of pressure, which will next be explained.

Barometric pressure is defined as the weight of air lying above any given place as commonly measured by means of the barometer, pressure being expressed in the number of inches to which it forces a column of mercury in the barometer. This, under extreme conditions at



THE FUNNEL-SHAPED CLOUD OF A TORNADO
The resemblance between this formation and the water-spout clearly marked (see page 87)
Photo Topical

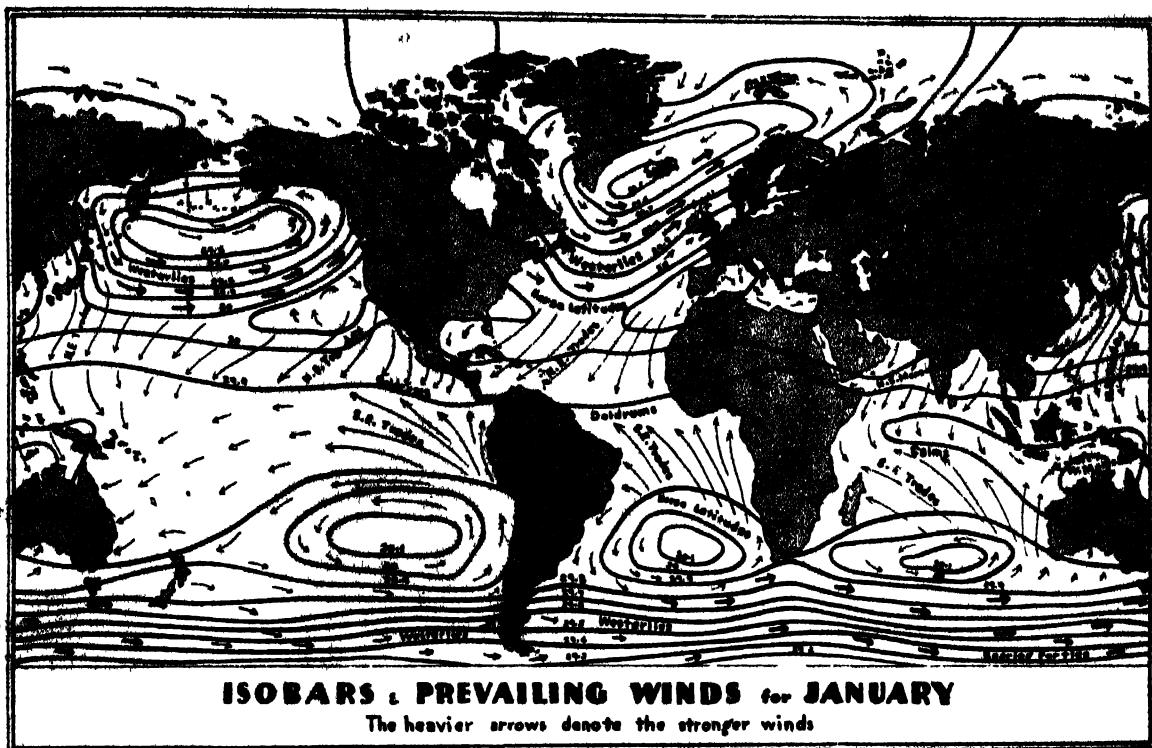
sea-level, may vary from about twenty-six inches to nearly thirty-two, but decreases with altitude. The rise and fall of the barometer was, for centuries after its invention about 1640, the only method used in forecasting weather, it being noted that a falling barometer prognosticated deterioration in weather, a rising barometer an improvement. In spite of this, like every other prognostic, being fallible, the latest research into the nature of weather systems has demonstrated that it is generally scientifically accurate and that any decrease in barometric pressure tends to be accompanied by an increase in the tendency of rainfall.

The pressure systems of the world do in fact determine (with certain local modifications) the rainfall of all districts and the direction of the prevailing winds whilst exercising an economically more important influence on

general climate than even temperature. The principle underlying all inequalities of pressure is that warm air rises and expands, thus reducing pressure and inducing rainfall, owing to the fact that warm air as it rises cools and cold air cannot sustain so much unprecipitated moisture as warm air. By this means are produced the convectional rains of tropical districts and the heavy summer rains of temperate regions. Conversely, cold air falls and contracts, thus increasing pressure and decreasing the tendency to precipitation. It might be supposed, therefore, that pressure would be lowest in the Tropics and highest at the Poles, and that the general circulation of the atmosphere would be one of warm air rising at the Equator and moving northward and southward to fall at the Poles, and conversely, of cold air falling at the Poles and flowing northward and southward towards the Equator, these directions being modified by the rotation of the Earth to north-east, south-west in the Northern Hemisphere and south-east, north-west in the Southern Hemisphere.

There is in fact a belt of low pressure in accordance with this principle in equatorial regions which moves north and south with the Sun to the two Tropics and gives two rainy seasons and two relatively dry ones, the former being contiguous at the Tropics of Cancer and Capricorn and separated by six months at the Equator, whilst there are regions of relatively high pressure at the Poles with comparatively low precipitation. The normal circulation is interfered with in both hemispheres by the interpolation of a belt of relatively high pressure in sub-tropical regions and a compensating belt of relatively low pressure in temperate regions.

Courses of Depressions in the North Atlantic. The air circulates round an area of high pressure (or anticyclone) in a clockwise direction and round an area of low pressure in an anti-clockwise direction in the Northern Hemisphere. In the Southern Hemisphere these directions are reversed. In both cases the directions are further modified by the air currents which blow outward from the centre of an area of high pressure and inward towards the centre of an area of low pressure. Near the centre of either type of system there is a tendency to light airs or calms. Areas of high pressure are generally stable and often remain stationary for weeks or months with little or no change in the pressure at the centre, or in the position of the central area of high pressure. Conversely, it is characteristic of areas of low



Compared with the corresponding map for July the westerly winds in the north Atlantic are much stronger owing to the southerly trend of the sub-tropical belt of high pressure and the greater intensity of the low pressure systems passing across the Atlantic.



The circulation of the air round regions of high and low pressure in the general direction of the isobars is apparent, as is also the tendency to calms near the centre of high pressure and in the equatorial zone of low pressure.



COAST EROSION

A landslide at Cowden, East Yorkshire, caused by a north-easterly gale and the consequent surge of the sea undermining the cliff. Whole towns along the east coast have been swept away in this manner.

Photo. Topical

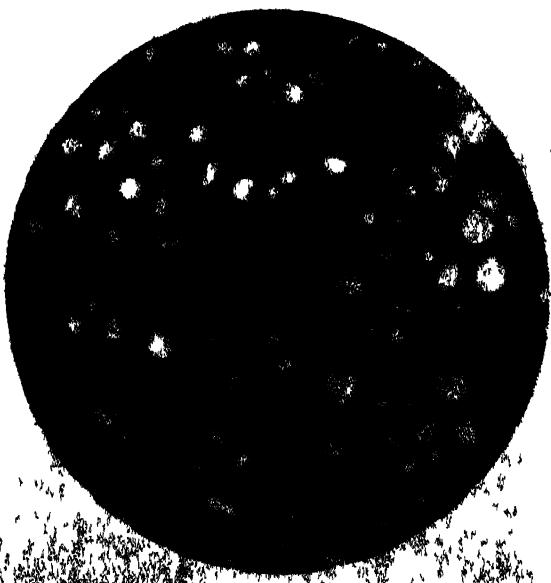
pressure, particularly in the temperate regions, to develop depressions or cyclones moving (in the Northern Hemisphere) generally in an easterly or north-easterly direction at a speed of from five to fifty miles an hour. Thus it is not strictly correct to speak of a permanent area of low pressure in the North Atlantic, but rather of a constant succession of depressions moving across that area. The most common course of such depressions is from a point in mid-Atlantic to the south of Greenland in a north-easterly direction between Scotland and Iceland to the coast of Scandinavia where they often "fill up" or disperse. Another less frequent course is from a point north of the Azores to the mouth of the English Channel, thence eastward to Belgium and across northern Europe to the Baltic Sea.

During the passage of a depression along the former course, winds in Britain and western Europe generally are southerly to south-westerly at the approach of the system, and westerly to north-westerly in its rear. In the case of the second course, winds are south-easterly to easterly in front of the depression and north-easterly to northerly in its rear. In either case abundant rainfall is to be expected, often associated with "secondary" depressions which form on the southerly fringe of the more northerly depressions and travel rapidly round the system in a north-easterly to northerly direction. The weather is invariably mild in the former case, with some fall of temperature in the rear of the depression; the second type

is associated with less mild conditions and in winter gives rise to many of the heavy snowfalls of southern England and northern France.

Doubt remains as to the exact process of formation of such centres of low pressure, but it is generally accepted that a great proportion of them arise from the fusion of polar and equatorial air, inevitable in the trough between the sub-tropical and polar areas of high pressure. With these cyclonic disturbances is associated over 80 per cent of the rainfall of temperate regions.

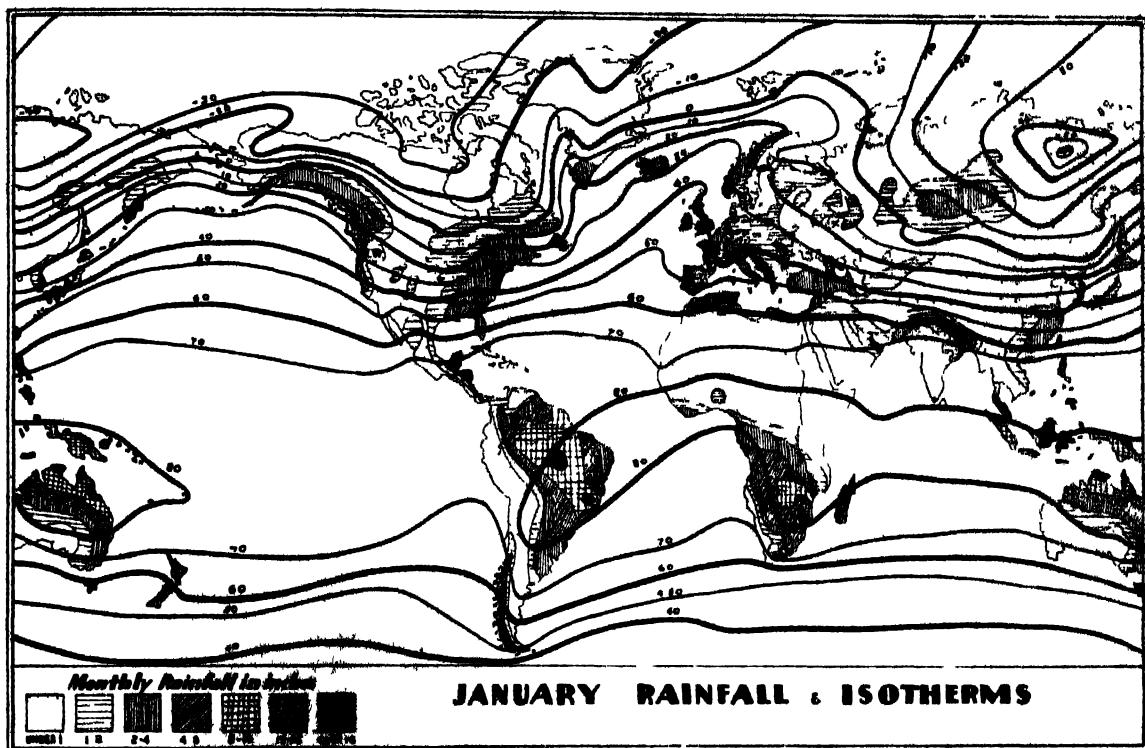
The isobaric map of the Southern Hemisphere shows that in that region, owing to the lesser size of continents, this general sketch of the circulation of the atmosphere corresponds with the actual pressure distribution. In the Northern Hemisphere, however, where land masses predominate, account must be taken of the complication introduced by the greater cooling of the continents in winter and the corresponding warming in summer. Here the isobars (imaginary lines joining places of equal mean pressure) do not run parallel with the lines of latitude to any greater extent than do the isotherms. Just as the equatorial region is permanently an area of ascending air, so the continents, and particularly the continent of Asia, become similar centres in summer, so



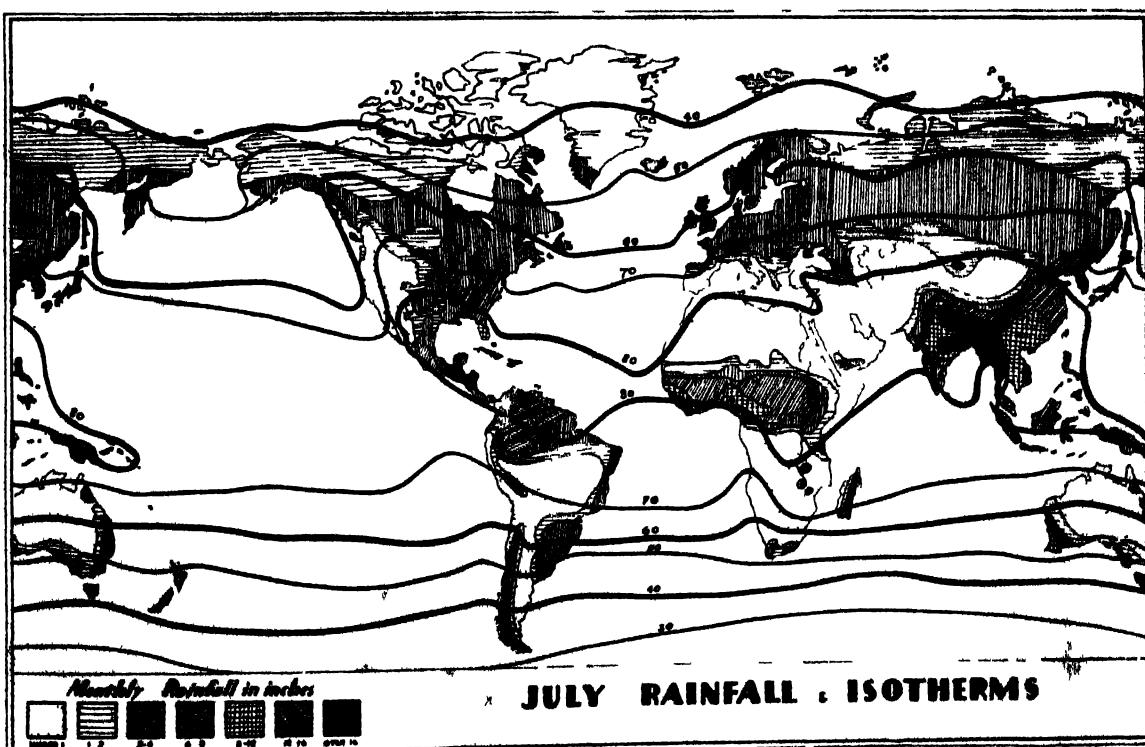
FOG PARTICLES

This photograph of particles of fog was made by means of a specially designed microscope fixed on a slightly greased glass slide to which the droplets adhered. The diameter of the particles shown was about four ten-thousandths of an inch. Although the diameter of individual particles varies within certain limits, there is always one predominating size.

Photo. Wide World



The map shows a tendency for rainfall to be heaviest in the vicinity of the highest mean temperatures as is also apparent on the corresponding map for July, but the tendency for rainfall to be severe near the coasts in the temperate regions north of the Equator is much more marked than in July. The pole of cold in Siberia associated with a low rainfall is also clearly defined. In the southern hemisphere the general similarity of distribution at all seasons can be observed.



A belt of consistently high rainfall near the Equator falls within the July isotherm of 80°, and a secondary belt of high rainfall in temperate latitudes occurs mainly between the isotherms of 60° and 70°.

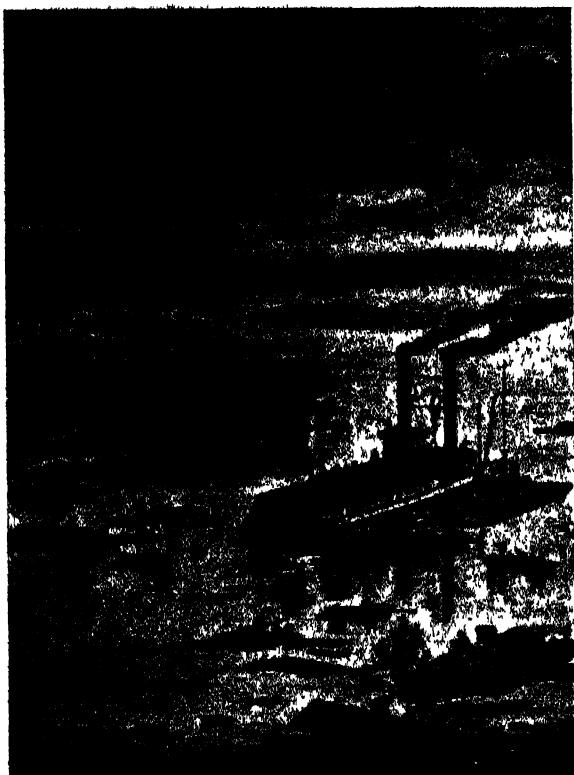
that an area of predominantly low pressure is formed. In winter, however, the process is reversed and a vast and intense anticyclone is formed over Siberia, sometimes extending into Europe, which greatly influences climatic conditions on the whole of the two continents.

To these facts must be added two important constituents of weather conditions. First, when moist oceanic air reaches a mountainous coast, it must necessarily rise, condense and

temperature with a slight seasonal and moderate diurnal range of light breezes and very heavy rainfall of the convectional or thundery type. At sea this area of calms was noted from an early date and was given the name of Doldrums. (2) The sub-tropical belts of the Northern and Southern Hemispheres extending from the Tropics of Cancer and Capricorn to about forty degrees north and forty degrees south respectively are characterized by a consistently high temperature and low rainfall, but with a more marked diurnal and seasonal range of temperature than the Equatorial Zone. These climatic belts move north and south according as the Sun moves north or south from the Equator. On the equatorial sides of the belts occur most of the great deserts of the world, including the Sahara, Gobi and Kalahari. (3) The North and South Temperate Zones, extending from the region of latitude forty degrees to latitude sixty-five or seventy degrees north and south of the Equator respectively are characterized by changeable weather, and moderate rainfall spread more or less evenly throughout the year, except towards the centres of the land masses of the Northern Hemisphere. Winters are moderately cold and summers moderately warm, and the seasonal range exceeds the daily range at any time of the year. (4) The Polar Regions characterized by very low temperatures, small precipitation mostly in the form of snow, and generally light winds.

Local and Seasonal Winds. The existence of many local and seasonal winds was observed long before any scientific reason had been discovered for their origin and cause. The most important of these in the days of the sailing ship were the Trade Winds which blow more or less permanently from the north-east in the Northern Hemisphere and from the south-east in the Southern Hemisphere in the area from the Tropics as far north as latitude twenty-five degrees, and as far south as latitude twenty degrees. It can be deduced from the nature of the circulation of the air in relation to pressure distribution that these winds blow over the oceans between the sub-tropical belt of high pressure and the equatorial belt of low pressure, moving north and south with the Sun as do these areas of constant pressure. Similarly, the central parts of the high pressure areas are the Horse Latitudes, almost as much dreaded by medieval seafarers as the Doldrums.

Over the oceans in temperate regions there are predominantly fresh westerly winds throughout the year, but these, as indicated above, are



THE OHIO IN FLOOD IN THE NINETEENTH CENTURY
A contemporary drawing which shows a river boat rescuing survivors
who are seen on roofs and in rowing boats

Photo: Wide World

precipitate moisture, consequently descending the leeward side of the mountain as a much less moist wind and with less precipitation. Secondly, large land masses reduce the speed of the wind by friction, so that in the interior of land masses even cyclonic winds have a greatly reduced force.

Principal Climatic Zones. Thus it is possible to reconstruct from first principles the four principal climatic zones and infer the local variations which must necessarily occur due to one or more of the foregoing reasons. (1) The Torrid or Equatorial Zone bounded roughly by the two Tropics is an area of high

CLIMATE AND WEATHER

more marked in the Southern Hemisphere than in the Northern. The greater strength of the westerly winds in the Southern Hemisphere was noted from the earliest days of navigation when they became known as the Roaring Forties. In the North Atlantic and, to an even more marked extent, in the North Pacific, the westerly winds are deflected to a general south-

westerly Monsoon from Java to New Guinea. In July, when the position is reversed, we find a south-westerly Monsoon in the Indian Ocean and a south-easterly Monsoon where in January there was a north-westerly wind from Java to New Guinea.

Most local winds, or, more accurately, winds which blow at particular seasons and have



THE OHIO IN FLOOD IN THE TWENTIETH CENTURY

An aerial view of one of America's most disastrous floods. In the foreground are empty tank cars floating in the flood-water. In the background is the Louisville, Kentucky, Terminus Station of the Louisville and Nashville Railway submerged to the roof.

Photo Planet

westerly trend, varying mainly between south and west with the passage of low pressure system.

The Monsoons of the Indian Ocean are directly related to the pressure distribution over Asia and Australia. The Monsoon blows in a north-easterly direction over the Indian Ocean, continuing the line of the north-east Trade Winds during the winter months when pressure is high over Asia. Pressure then being low over Australia, the air circulates as a north-

acquired local names, fall within the general scheme described. Thus the Bora of Italy and the Adriatic Sea is a north-easterly wind blowing from central Europe in the rear of a depression which has passed along the Mediterranean. When in winter pressure is relatively high over the land mass of Europe and the temperature low, a great mass of cold air sweeps into the Mediterranean region, often reaching gale force, owing to the steep gradient between the depression and the high pressure of the

continent. The strength of all cyclonic winds, in fact, varies according to the intensity of pressure systems around which they blow. When the "barometric gradient" is steep, the winds are of strong to gale force.

In the south of France a wind of precisely similar origin to the Bora is known as the Mistral. The Sirocco is the wind blowing in

ance. Conversely, the normal cause of a storm of the thundery type is some instability in the atmosphere, or the juxtaposition of layers of air of greatly differing temperature and electrical content. Most local storms fall into one or other of these categories and are sometimes produced by a combination of both conditions. An important corollary is that in regions where



MONSOON CLOUDS

A study of the Monsoon taken on the river Hooghly near Calcutta

Photo Keystone

front of a depression moving eastward along the Mediterranean corresponding to the Bora or Mistral behind it. The air borne by this wind being derived from northern Africa is warm, but crossing the Mediterranean gathers moisture rapidly and so reaches the Mediterranean coast of Europe as a very warm and very humid air current. The Hamsin of Egypt is a southerly wind of similar origin, but having passed over no sea remains a dry, warm wind.

Storms and Local Disturbances. The normal cause of severe gales is a very rapid fall in barometric pressure with a consequent rapid inflow of air towards the centre of the disturb-

the disturbances are unusually large and indeterminate, as in the North Atlantic, the storms associated with them are of mild intensity, whilst in other regions, such as the Indian Ocean, where cyclones are of relatively small diameter but great intensity, the consequent storms are correspondingly severe.

In temperate, as well as tropical climates, the exceptionally heavy rainfall associated with thunder storms is clearly marked, this being a sign of a vigorous vertical motion of the air. We have seen that hot air rises owing to expansion, a fact which explains the other characteristic of thunderstorms in temperate



DUST STORM APPROACHING KANSAS CITY

These whirling spirals of dust often travel at more than fifty miles per hour. They are caused by upward currents of air which draw the dry particles from the semi-arid countryside.



HIGH WIND IN HONDURAS

A view of the town of Balice, British Honduras, after the passage of a hurricane which caused the death of over 1000 people. In the right foreground is a ship hurled by the storm from the harbour into the main street.

Photos Wide World

climates, that they occur more frequently in summer than in winter when the heat capacity of the Sun is less, and more frequently in the early afternoon than at other times of the day or night. Again, polar air flowing into temperate regions represents a mass of cold air moving into a warmer atmosphere and, in addition, gaining heat by contact with the Earth. Such air, therefore, tends always to rise rapidly when heated by a midday summer Sun. Conditions ideal for the formation of these storms due to instability of the atmosphere are, therefore, reached when there is a "break-through" of polar air at the rear of a depression, when the barometer is still low and the humidity of the air correspondingly high. At the rear of depressions, also, a maximum horizontal as well as vertical instability occurs, a sudden fall of temperature being generally noted immediately after the passage of the trough of low pressure when the barometer begins to rise.

In the Northern Hemisphere this phenomenon is moderately well marked, many line squalls (the "line" being the line of the trough in which the direction of the isobars changes) being accompanied by a sudden change of wind from south-west to north-west, with heavy rain of a squally type and a tendency to thunder, particularly in summer. A similar onset of colder wind has the local name of Pampero in South America and Southerly

Buster in Australia. It must be remembered, incidentally, that in the Southern Hemisphere the Pole lies to the south, so that a change of wind direction to the south, as in the Southerly Buster, is equivalent to a break through of northerly winds in the Northern Hemisphere.

The precise cause of the electrical discharge which gives rise to lightning is disputed, but it has been established that the discharge may pass from cloud to cloud or from clouds to Earth, due to excessive charging of particular clouds. It is possible that this occurs owing to the breaking up of large drops of rain into a large number of smaller particles, a phenomenon which is most likely to occur in a vertical upward current of air in which the drops are carried to a great height and then fall through the atmosphere at a high speed. There is no distinction between forked and sheet lightning, the latter being the normal electric discharge veiled by a cloud or reflected from clouds below the horizon. The sound of thunder is caused by a single clap as the air which has been tended meets again, the single clap being intensified and multiplied by the inevitable echoes and reverberations.

There is evidently a close connection between the large depressions of temperate regions and the relatively small but more destructive revolving storms of latitudes nearer the Equator. The common tornado of America and India



HURRICANE IN FULL BLAST, FLORIDA, U.S.A.

Photo Topical



A WATER SPOUT

The funnel-shaped cloud descending from the main cloud mass is a whirling current of air which draws the water upwards. The formation of a tornado, or whirlwind, illustrated on page 78, should be compared.

Photo Topical

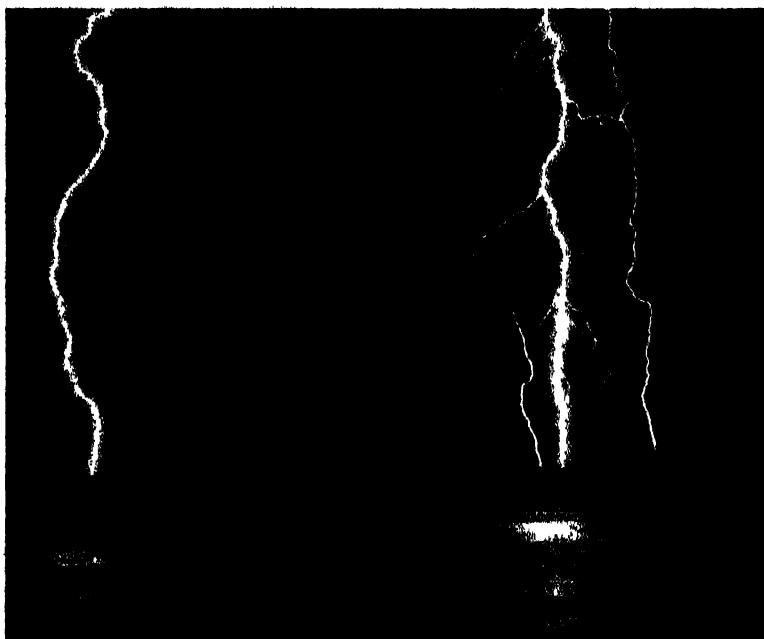
is a small and very intense area of low pressure into which the air flows with enormous rapidity, developing a vertical motion as it approaches the centre and revolving in a counter-clockwise direction. The usual sign of such a storm is a funnel-shaped cloud hanging from the main cloud mass, marking the centre of the whirling mass of air and often reaching to the Earth. Although the prime disturbance may be only from a few yards to half a mile in diameter the wind velocity often exceeds 200 miles per hour and, in conjunction with the circular tearing motion, strips everything which comes within its path, including bridges, vehicles and cattle, from the ground. The storm will sometimes carry its objects for a considerable distance, depositing them with greater or lesser force according to its caprice. Indisputable records exist of animals being carried over two miles and deposited on the ground alive.

Tornadoes are by no means unknown in Great Britain, several being recorded in the twentieth century. The most destructive was that of 14th January, 1931, when considerable structural damage was done in the town of Birmingham. Another on 27th October, 1913, was accompanied by some loss of life; it destroyed numerous houses in South Wales.

In equatorial regions similar storms are frequent, though generally of less intensity and somewhat greater diameter. The typhoons of the China Sea, the hurricanes of the West Indies and the cyclones of the Indian Ocean are all of similar type, but wind speeds rarely exceed a hundred miles per hour. On the other hand the lowest barometric pressures ever

recorded, approximating to twenty-six inches, have been noted in these storms. A few of the West Indian hurricanes cross the Atlantic and reach the coast of Europe usually in about four days, but have by then increased their diameter from a few miles to several hundred, and by compensation have lost their intensity. The desert Habboob, the waterspouts of tropical areas, and the whirlwind of temperate countries are all in the nature of revolving storms of small proportions.

Visibility. A feature of climate which in some regions has considerable economic and physical effects is visibility. There is no dividing line between mist and fog except in respect of the visibility which it allows. In clear dry air, unpolluted by dust and smoke, objects can be discerned at a very great distance, one hundred to two hundred miles being not uncommon. Even the latter figure has been exceeded by observation from aeroplanes. Apart from certain slight modifications (as, for instance, the frequently observed "heat haze" of tropical and temperate climates caused by the differing humidity and temperature of adjoining layers in the atmosphere), the degree to which this maximum of visibility is reduced depends on the number of particles held in suspension in the air. These latter are either particles of water or solid matter. The two factors necessary for the number of suspended particles to increase, and the consequent formation of mist or fog, are light airs and an inversion of temperature in which the air nearer the ground (or sea) falls to a lower temperature than the temperature of the layer immediately above it.



A BRILLIANT DISPLAY OF LIGHTNING PHOTOGRAPHED AT JERSEY
Photo Keystone

The former factor is only necessary in order to prevent rapid mixing of the two layers. When an inversion occurs the warm upper atmosphere acts as a lid or blanket, preventing the diffusion of the water particles.

On land these conditions are most usually fulfilled in fine weather and at night when surface radiation is at its greatest and the air is rapidly cooling. At sea a current of warm air passing over colder sea will produce the same effect, a phenomenon which explains the fogs prevalent, for instance, off the eastern coast of Canada where a cold current flows southward from the Arctic, and the summer sea fogs of temperate coasts. It will be observed that the latter generally disperse as they are carried inland and the air becomes relatively warm through contact with the Earth.

Fog banks generally vary from twenty or thirty feet in depth to 1000 feet, only rarely exceeding the latter figure. They are in the nature of stratus clouds and have usually a sharp upper line of definition, as may be seen by an observer on any isolated hill which is above the fog limit.

A different type of fog is that composed of low-lying cloud, generally nimbus. This most frequently occurs in mountainous districts, though such cloud formations have been noted on land in south-east England at a height of less than 200 feet. The sudden onset of the

typical mists of Dartmoor, Bodmin Moor and the Pennines is explained by this cause. The growth of industrial towns has added a third cause—the smoke fog caused solely by an inversion of temperature in which the warm upper layer of air prevents smoke from escaping. Over a town of the size of London as much as fifty tons of soot may be held in suspension in this way at one time, and the soot may be carried by light winds and deposited as much as fifty to 100 miles from the metropolis. Curious evidence of this is provided in England by the noticeably darker appearance of sheep in the Home Counties than in the less industrialized districts of the west. Occasionally these smoke balls are less than 100 feet in depth and leave the tops

of the higher buildings free. They are always more pronounced near street level.

Sociological and Economic Effects. The most important commentary on the distribution of climatic conditions is that the Temperate Zones have in the past 3000 years proved most suitable for the development of civilization. The effects of climate are in fact twofold, in their relation to the activity of man himself and in relation to the productivity of the Earth. Although the polar summer, even when the temperature is considerably below freezing-point, is invigorating and remarkably immune from micro-organisms, such as that of the common cold, polar winters are too severe for an active life to be sustained. The absence of light as well as the intense cold is an important factor and has been found to have a depressing psychological effect from which even the Eskimos do not appear to be immune. Great cold can be sustained in a dry, still atmosphere, but the least wind in any temperature below zero Fahrenheit has fatal results.

Although there is no part of the world where the temperature is too high for life to be sustained, the humid heat of the equatorial belt is unfavourable to activity of mind or body, and a direct contributory factor in retarding the development of peoples native to that zone. In addition, diseases such as malaria, which is spread by the bite of an insect

flourishing in warm swampy ground, have proved a serious hindrance to the full development of the country.

In some districts, particularly in India and equatorial South America, a climate similar to that of temperate countries is found on the high tablelands. There a full and active life can be led by Europeans. It is an often noted fact, also, that the hill tribes of tropical Africa and America have reached a much fuller state of social development than the coast and valley tribes of the same latitude.

Economic Effect of Rainfall. Economically, rainfall is of greater importance than temperature. Agriculture is pursued successfully in parts of Siberia during the short hot summer solely on account of the favourable rainfall. It has been found that a rainfall of nearly twenty inches distributed throughout the year is necessary for a successful cultivation of grain crops. Hence, apart from the recognized desert areas of the world, where any

rainfall is unusual, there are many districts, notably in the central United States of America, where agriculture would be difficult but for the increasing use of irrigation. Where life exists in the desert regions, such as in the case of the aborigines of Australia, the state of development is retarded to an extraordinary degree, so that these latter have never emerged from Stone Age culture. Conversely, an over-abundant rainfall, such as in the equatorial belt of Africa and South America, also renders agriculture difficult, the clearing of the primitive forests being first a task of great magnitude, only surpassed by the difficulty experienced in preventing the undergrowth from spreading immediately over any clearing that has been made. Very heavy rainfall also is inimical in itself to the cultivation of food crops and, in a lesser degree, to the rearing of cattle, which suffer from various diseases if kept for long on constantly wet ground from which the moisture never evaporates. Apart from artificial



FOG AND ALTO-STRATUS CLOUD

A photograph taken from an aeroplane at a height of 4000 feet, showing a stratified layer of fog over Devonshire, with a layer of alto-stratus above. This photograph should be compared with that on page 75

Photo: *Planch*

irrigation certain districts with a deficient annual rainfall, such as the Nile Valley, are irrigated naturally by the annual overflow of the river due to heavier rains near its source.

Although the temperate regions with their comparatively kindly climate have proved most favourable to the development of advanced civilizations, it has sometimes happened that small communities living in a too generous climate have become decadent through plenty. Thus the tribes inhabiting some of the islands of the Pacific were able to live a full life with



PRIMITIVE METHODS OF IRRIGATION

Lifting water more than two feet from a river into an artificial channel by means of a "scoup"

Photo Indian Trade Commissioner

adequate food on the fruits of one or two hours' work a day. The result was that they were unable either to resist the white man or to adapt themselves to his ways. It has been noted that the warlike qualities of a race tend to vary according to the hardness of the struggle with Nature; we shall see how famine breeds energy and migration; conversely, plenty breeds idleness and contentment. It is at least open to doubt whether the leisure which has been artificially produced in European and American civilizations will prove an unmixed blessing—at least if viewed from the standpoint of preservation of the race.

In the countries most favoured by climate, differences in rainfall determine the staple crops. Thus in Britain wheat is best cultivated in the warmer summers of East Anglia and the south-eastern counties than elsewhere. For

wheat production an annual rainfall of between twenty and thirty inches has been found necessary; a more generous rainfall is just as unsuitable as a more scanty one. In the wetter regions of the west and north oats and barley flourish better, but it is noteworthy that in the cooler summers of the extreme west and Scotland harvest is delayed by nearly a month as compared with the south-east of England. The climate of the southern United States is most favourable to the production of maize and cotton, hence these are the principal crops; the cooler climate of Canada, however, is more suitable for wheat. The rice fields of India, the hemp of parts of Africa, are only two further examples of a list which might be extended indefinitely.

Clothing and Housing. Housing and clothing, also, are largely determined by the exigencies of climate, although civilized man has shown a remarkable power of adaptation in these respects. Climate at least is responsible for the importance of cotton for clothing in tropical countries and of wool in temperate and sub-Arctic districts. It is a kindly dispensation of Nature that the pelts of animals found in Arctic climates are suitable for protecting the inhabitants against the prevailing cold, whereas the pelts of tropical animals generally lack the fur which gives the former their warmth. In general the pelts of animals are the principal garments in Arctic regions as evidenced by the clothing of the Eskimo. In civilized countries of temperate regions cotton and silk compose the summer garments, wool the winter ones; in the tropics cotton and silk are used to the exclusion of wool. Among uncivilized peoples wool is still the staple material in temperate climates, whilst in tropical climates clothing is dispensed with either altogether or to an effective extent.

Similarly, in housing, the chief need of Arctic and sub-Arctic tribes is that their homes should be capable of retaining heat; hence the small enclosed snow houses of the Eskimo; in temperate climates, however, retention of heat is less important than protection from the wind; hence we find huts of thatch or wattle and daub, whilst in tropical regions the need of housing is negligible except as a protection against animals. So the peoples of some tribes sleep round a fire without any covering; others build their huts in trees; the tent, or similar dwelling, makes its appearance especially in nomadic peoples for whom it has the added advantage of being easy to transport from place to place.



CLIMATE AND DRESS

Adaptation of dress to climate is well marked in civilized as well as primitive peoples. Among primitive societies the natives of Indo-China (1) or of sub-tropical Africa (6) are able to dispense almost entirely with clothing, whilst the San Blas Indians (7) in a temperate climate adopt thick woollen clothing. The furs of the Alaskan trapper (3), the sheepskin cloak of the Hungarian shepherd (2), and the white duck of tropical India (4) are examples of adaptation to Arctic, temperate, and tropical climates respectively. The pith helmet of (4) and the wide-brimmed hat of the

Burmese water-carrier (5) are alternative methods of mitigating the power of the Sun in those latitudes.

Photos: Sport and General; Keystone; Planet; Wide World

Even the buildings of civilized peoples are adapted to climate; modern "skyscrapers" are constructed with enough "sway" to counter the greatest wind force expected in the district in which they are built. In other words, the

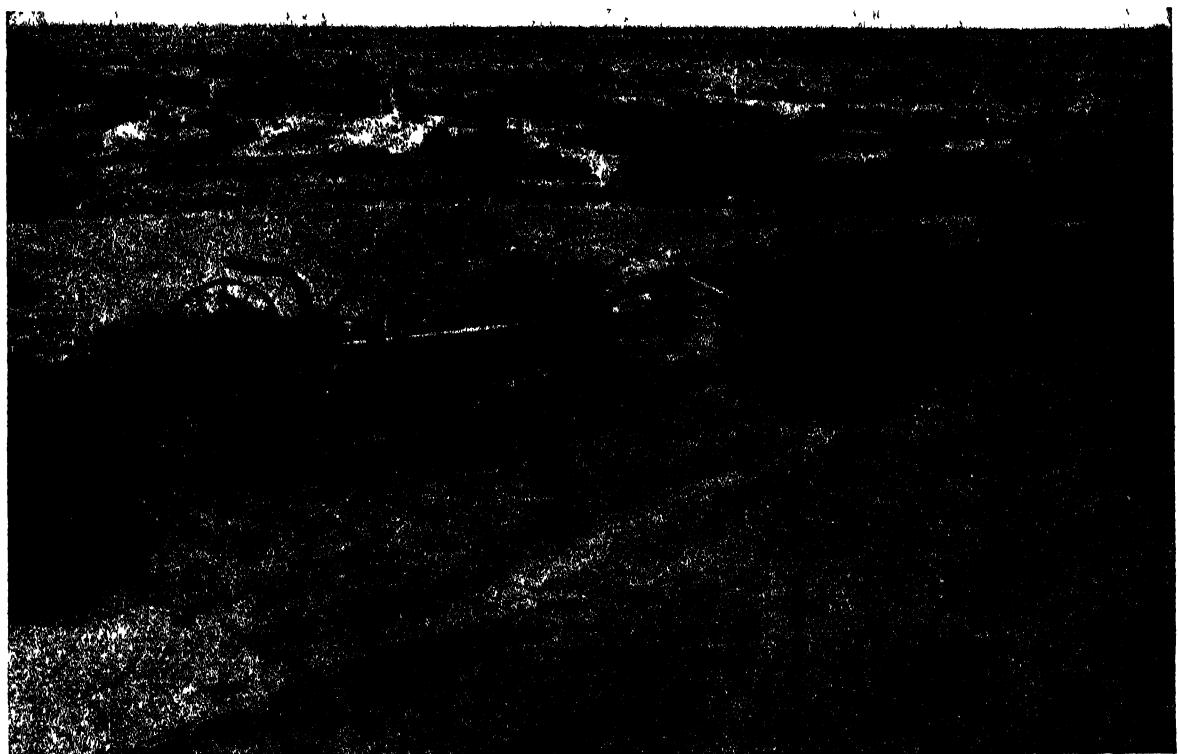
pressure exerted by gusts of hurricane-force is diminished when the fabric literally bends before the wind in precisely the same way as a tree. If the buildings were rigid a far greater strength of material would be necessary to

counteract the force of the wind. In tropical countries a shaded veranda is an essential part of the house. Buildings are whitewashed in order that the colour may act as an agent of refraction to the rays of the sun, since it is well established that light coloured objects reflect back the sun's heat whilst darker ones absorb it. In the same way white clothes are widely worn by Europeans in tropical climates. Finally, in districts subject to flood many buildings are raised on piles, a device which has been followed since prehistoric days as proved by the lake dwellings excavated in Somerset.

Changes in Climate. The existence and nature of climatic changes has always been a matter of doubt. That such periodic changes in weather conditions occur on a small scale over a matter of a few years and on a much larger scale over periods of thousands of years is established for many districts of the world. Thus, to quote examples of both kinds, the mean winter temperatures of Europe have been much higher in the twentieth century than in a corresponding period at the end of the nineteenth century. Similarly, it is inferred from excavation that the Sahara has not always

been a desert, but was once a fertile, well-watered plain. Again, there is indisputable evidence of four or five periods during which much of northern Europe has been covered in ice-sheets similar to that which now covers Greenland. Recent observation has shown that temperatures are tending to rise at the Pole and that the Greenland ice-field is diminishing in size.

Although these and many similar instances may be quoted, there is little evidence to indicate the reason. It is possible to observe a regular alternation of wet and dry periods in the Northern Hemisphere, but no connection can be observed between these changes and any other physical fluctuations. So, in the case of Britain, a notably wet period occurred during the Roman occupation of the country and again in Norman times. It is possible that one cause which led the Goths and Visigoths to descend on the Roman Empire of south-eastern Europe, and the Saxons to make inroads on Roman Britain at about the same time, was a general diminution of rainfall over Europe which would inevitably force these uncivilized tribes to seek fresh lands after a few years of



DESERT COUNTRY

Scrub and tufts of rank grass are the only vegetation in an enormous area of semi-arid country in the west central districts of North America. Many square miles of country such as that shown above have been rendered productive by irrigation.

Photo: Keystone



CLIMATE AND HOUSING

1 and 2. Dwelling places suitable for a tropical and semi-tropical climate respectively. On the left is a breakwind of the Malayan aborigines, on the right an Egyptian labourer's cottage made of sugar cane. 3. Building an Eskimo snow-house, or igloo. Made from blocks of ice, this partly underground shelter gives perfect protection from the cold. 4. A house built on timber piles. Such dwellings are found in country where a moist, hot climate produces jungle harbouring dangerous animals. 5. The governor's palace at Funchal, Madeira, whitewashed to reflect the rays of the powerful Sun. 6. A village built on piles to avert danger of flooding at Port Moresby, Papua.

Photos: Planet; Sport and General; Wide World; Keystone; Malayan Information Agency

drought and consequently deficient crops. It has been observed that a single year of drought renders the modern tribes of Inner Mongolia sterile; it is impossible to foresee the consequences of a succession of drought years in that district. Certainly the result would either be partial extinction of the tribes through starvation or a mass migration which might well extend into Europe. In Iran (Persia), Mesopotamia, and other parts of the Near East, civilizations seem to have arisen and dispersed according to such variations in the climate.

Sun Heat and the Ice Ages. It is generally assumed that the Earth was once very much hotter than at the present time and it is often

thought that the process of cooling continues. It is now believed, however, that this process is counteracted by radioactive heating produced by certain mineral components of rocks. Recently, too, the theory has been postulated that, far from solar radiation decreasing, it is actually increasing. Again, although it is proved beyond dispute that there have been four or five cold periods of long duration in many parts of the world, known generally as Ice Ages, and correspondingly warm periods intervening, of which the present age may be said to be one, there is little to show that these periods are contemporaneous in all parts of the world. In Europe and in temperate climates generally,

mean temperature depends within a wide range on prevailing wind. If the Atlantic series of depressions were deflected to a course south of latitude fifty degrees, the prevailing south-westerly winds would be replaced by a prevailing north-easterly current which might well lead to a gradual accumulation of snow on the higher ground of northern Europe and consequent formation of glaciers. If this were combined with a temporary deflection of the Gulf Stream, thus lowering the temperature of the air over the North Atlantic, such a result would inevitably follow.

It is possible that some such local variation in the circulation of the atmosphere may be responsible for the occurrence of Ice Ages in different parts of the world. Such a deflection, incidentally, would probably bring rainfall to northern Africa by bringing it within the scope of the cyclonic disturbances.

There is abundant evidence that at some time in the history of the Earth the Sahara desert has been relatively fertile, as also that most of the other great deserts of the modern world have been subject to moderate rainfall. The effect of rainfall on apparently desert regions is well seen after the periodic slight rain which falls in parts



WINTER HAVOC

Above: Interference with road and telegraphic communication during a severe English winter.
Below: An iceboat clearing the floes from a canal in Cheshire.

Photos Topical

of the Sahara, when within 48 hours the ground is covered with springing vegetation which withers within a few days from lack of further moisture.

The other theory is that the Sun is in fact a variable star. Its heat output is known to vary slightly from year to year. It is conceivable that it varies to a greater degree over a longer period. Such a diminution of output, it is suggested, is the reason for the repeated occurrence of cold periods characterized by the formation of glaciers in temperate regions.

With regard to temporary changes of climate within a shorter period many cycles have been suggested. Here again evidence is deficient owing to the relatively recent introduction of exact meteorological recording. It has been observed that in periods when sunspots are most numerous rainfall is heavier in certain tropical districts. Such sunspot maxima occur at irregular intervals of nine to thirteen years with an average periodicity of 11·1 years, but though the curve of sunspot frequency corresponds with the curve of rainfall in some districts, it does not always do so, nor does the principle apply to all districts. Similarly, the Bruckner cycle of thirty-five years has been minutely explored, but does not reveal any notable constancy. The most that can be said with certainty is that there are certainly local, and perhaps general, marked changes in temperature, rainfall, and prevailing winds at intervals of many thousands of years, and that within shorter periods there is a tendency for similar minor fluctuations which may persist for a few years or for several centuries.

The Bible story of the Flood has recently been explained by reference to such fluctuations. Foundation for its truth is given by the similarity of tradition relating to flood disasters in many parts of the world not normally liable to flooding in a way that, for instance, the Mississippi basin periodically suffers. It has



SNOWPLOUGH IN ACTION

Severe weather conditions on the line at Ashbourne in February, 1947, led to this comparatively rare sight on the railways in Southern England

Photo British Railways

been shown that if the ice caps over the Arctic and Antarctic were to melt, enough water would be released to raise the sea-level by an average height of 150 feet. Such a catastrophe would inundate many thousands of square miles of the Earth's surface. The observed existence of "raised beaches" in many parts of the world is adduced as contributory evidence of the truth of this hypothesis.

Within the last fifty years a marked increase of temperature has been noted in Greenland where the ice cap is growing less extensive and less deep. There is no evidence of a compensating decrease in temperature in other parts of the Arctic or in the Antarctic regions so that it is not an unreasonable hypothesis that some increase in the mean height of the ocean may ultimately be noted if the prevailing tendency continues.

LIFE ON THE EARTH

FAUNA. It is common knowledge that animal life varies in different countries. Every one knows that tigers are found in India and hippopotami in Africa. The causes of the diversity of animal life to-day, the restriction of some animals to small areas while others range over whole continents and some are cosmopolitan, can be elucidated by a study of the histories of animals and their movements.

Each species of animal is restricted to a certain part of the Earth's surface, known as its habitat. This may be fresh water, sea-water, mountains, plains or the Tropics. Although the animal will be found only in its habitat, its area of distribution may be very large. Thus a certain fresh-water snail is common all over Asia and Europe, but in this area it is confined to where there is fresh water. The size of the area over which species can range varies enormously, in some cases comprising several continents, in others only a few square miles. The reptile, tuatara, is found only on a small island off the coast of New Zealand, while bats and gulls are cosmopolitan.

The main factors determining the present-day distribution of animals may be summed up as follows: (1) The position of the animal's original home, the animal's means of dispersal,

and the barriers to migration. (2) Constitution of the animal and the physical conditions of the region. (Reptiles are not adapted for cold regions and become rarer as the Poles are approached.) (3) Changes that have occurred in the land-masses and in the climate. (4) The intervention of man.

Dispersal and Barriers to Migration.

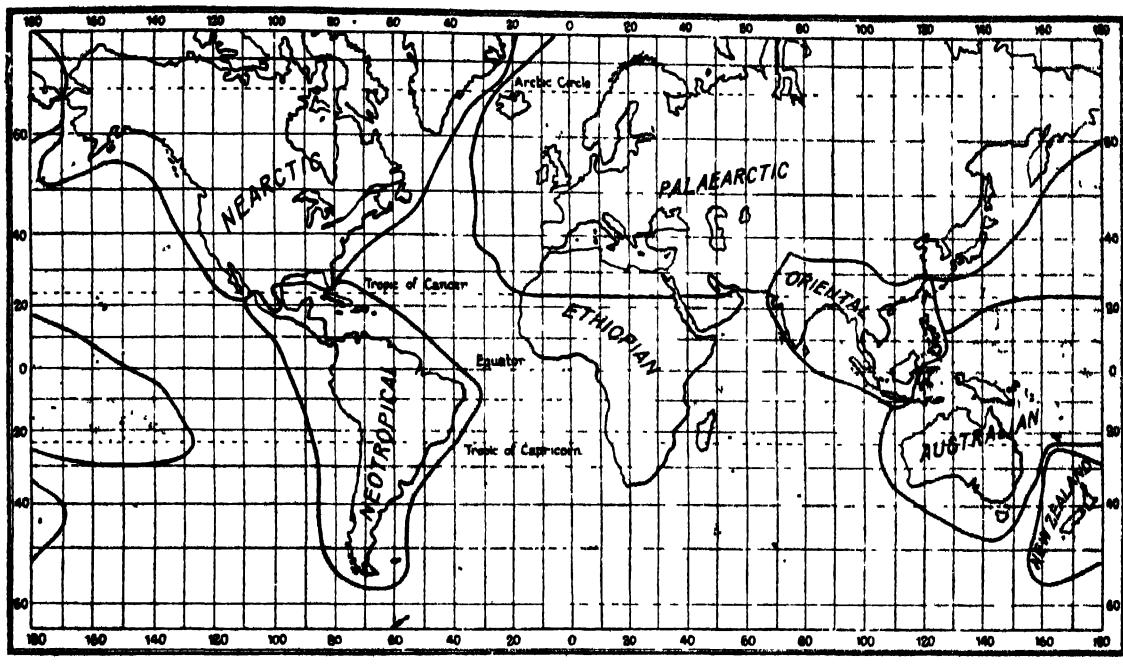
An animal's original home can be determined by studying the history of the animal as shown by fossils. The spread to surrounding regions depends on the animal's means of dispersal and the presence or absence of any barriers to its migrations. Birds and bats, being able to fly, can travel easily; fresh-water snails and amphibia have limited means of dispersal since they can only live where there is fresh water. The barriers to migration vary with the species concerned. To marine animals, continents and temperature-conditions are barriers, while land and sea are barriers to fresh-water animals. The range of land-animals is limited by seas, rivers, mountain ranges, deserts and the climate. To some animals the barriers are insuperable, while others can overcome them where they are not too formidable. For example, to animals generally, large deserts, high mountain ranges and wide stretches of water form impassable barriers, but most mammals can swim across a narrow stretch of water. A wide river, however, is insurmountable to monkeys, which are unable to swim.

The length of time the barriers have existed can be ascertained from a comparison of the fauna existing to-day on each side of the barrier. If it is a recent one, then the fauna will not show many differences, since there has not been sufficient time for species to evolve along new paths. On the other hand, if a barrier is an ancient one, the faunas will be quite different. Thus the faunas of Great Britain and Europe are very similar since the Straits of Dover are not very old geologically; but the fauna of New Zealand is strikingly different from that of any other country. New Zealand has been isolated as a land mass for an immense



BAT

The only mammal capable of flight
Photo Topical



It is possible to divide the Earth's surface into a number of regions, the inhabitants of each of which resemble each other and differ from those of other regions, as shown on the above map.

period of time. If a species or other group of animals is found to-day in confined regions, widely separated from one another, the species is very old.

Constitution of the Animal and the Region. All animals are adapted to their environment, and in the different environments existing, different species of animals are found. Some live only in cold regions, others only in the Tropics; some in forests, others on plains, and so on. The particular physical conditions of a region gives rise to a fauna that is characteristic of that region. The inhabitants of tropical rain-forests are brilliantly coloured to harmonize with the colourful, luxuriant, tropical vegetation. Also they are adapted to an arboreal existence. Animals common to tropical rain-forests include such types as tree-snakes, boas, chameleons, monkeys, opossums and lemurs, all arboreal animals. Some inhabitants of rain-forests have developed the principle of the parachute; the flying frogs of Malay, flying dragons of India, flying phalangers and squirrels are examples.

An unfavourable environment, such as a desert, has its characteristic fauna. All desert living reptiles (skinks, iguanas, horned toads, desert snakes) are great burrowers, with eyes and nostrils protected from the sand. Desert mammals are swift-moving, usually having elongated limbs, for example, gazelles and

springboks, or they may be able to exist for long periods without drinking, as does the camel.

Classification by Zones. Most animals are susceptible to climatic conditions, and in passing from the Poles to the Equator, a number of zones can be marked out. In each zone different kinds of environments, inhabited by different kinds of animals, are encountered, and a rough classification of animals can be made according to the zone and habitat. The zones are as follows: a cold region at the Poles, then a cool temperate region, a warm temperate one, and finally a tropical region. Similar regions can be distinguished in passing from the plains to the summits of high mountains, giving a vertical distribution.

Some animals are indifferent to climate and have a long vertical and horizontal range; the puma ranges from Canada to Patagonia. Animals can move from one zone to another, but their ability to survive depends on their power of adaptation to the new environment. Tropical animals do badly in temperate surroundings. In general it seems that temperate living species stand the change much better when transferred to the Tropics than when transferred to colder regions. The fauna at the tops of high mountains (Alpine fauna) has a superficial resemblance to Arctic fauna; the change of fur colour in mammals (the fur becomes white in winter) is noticeable. Typical



PALAEARCTIC REGION

The family of the Bovidae originated in Europe, among its members are the sheep (4), goat (6), and yak (2). The bison (1) is one of the few members of the family to have become established in North America, where its few survivors are now protected. North America was the original home of the horse (3) but the animal became extinct there and was re-introduced by the Spaniard Is. The marmot (5) is a native of the Swiss Alps.

Photos Photopress, Topical, Planet, Wide World

inhabitants of Arctic regions are reindeer, polar fox, wolverine, lemming, arctic hare and snowy owl. The penguins are characteristic of Antarctica. Alpine fauna of the temperate and tropical zones includes the Rocky Mountain goat, chamois, yak, muskdeer, bighorn and chinchilla. A study of the distribution of animals based on the habitats and zones of different countries is rather unsatisfactory in that such a method does not bring out either the relationships existing between the faunas or the past connections between lands now separated.

Zoo-geographic Regions. A better method is to take particular groups of animals and to study their distribution over the Earth's surface. Not all animals are of equal value in such a study. Animals having a limited means of dispersal are preferable, and for this reason mammals and birds (excluding the strong-

flying cosmopolitan forms) are the best types to use. On the basis of the distribution of mammals and birds, it is possible to divide the Earth's surface into a number of regions (zoo-geographic regions) the inhabitants of which resemble each other and differ from those of other regions.

Although such a classification is incomplete and unsatisfactory in many respects, it does bring out the probable place of origin of an animal and the migrations that have occurred.

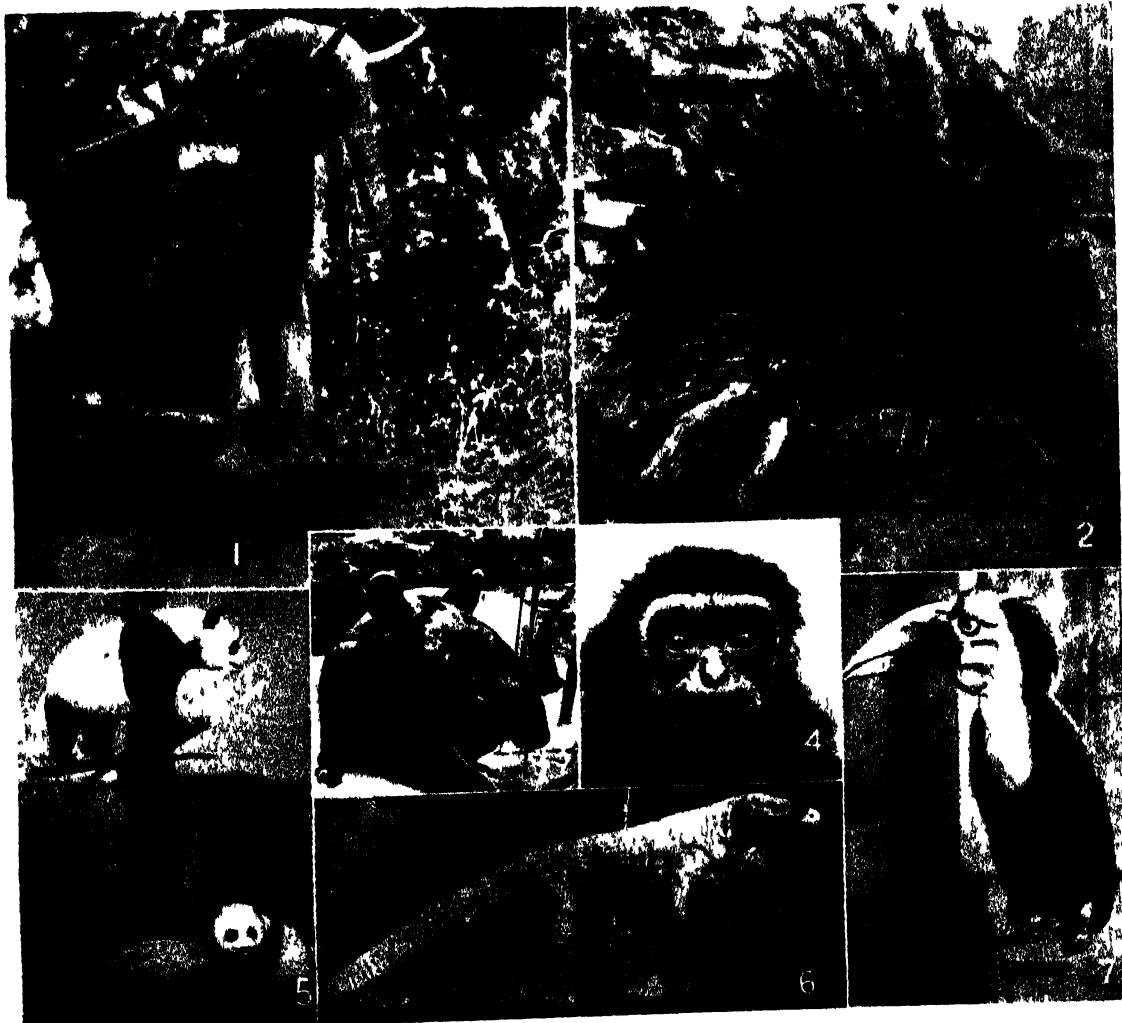
Palaeartic Region. This comprises the whole of Europe, Africa and Arabia north of the Tropic of Cancer, the whole of Asia except the Indian Peninsula, Thailand and south-east China, and includes Japan, Iceland, the Azores and the Cape Verde Islands. The north, west and east boundaries consist of ocean, while in the south an efficient barrier is formed by the line of deserts stretching from the

Sahara in Africa to the Roba el Khali in Arabia. The Mediterranean is not a boundary, since Europe and North Africa were probably connected by land bridges until recently. In Asia the Himalaya form a natural boundary. South-west and eastward the boundaries are not so well defined but are formed roughly by the Indus and the Yangtse-kiang Rivers.

Most of the animals found in the countries of this region are found elsewhere. The region blends with the adjacent tropical ones and in the past was the focus from which animal migration proceeded. However, there are several animals that are characteristically Palaearctic.

Horses, weasels, moles, dormice and camels (in the desert regions) are practically confined, while the great range and diversity of the family Bovidae, comprising sheep, oxen, goats and antelopes, is peculiar to the Palaearctic. Among the Bovidae are the yak of Tibet and the chamois. Hares, otters, rabbits and foxes are characteristic of the temperate regions and jerboas are found around the eastern Mediterranean. Among birds, pheasants, robins, tits and magpies are common. Proteus, an Amphibian, is confined to central Europe.

Ethiopian Region. The animal life of this region makes it one of the best defined. The region consists of Africa and Arabia south of



ORIENTAL REGION

There are only two species of elephant existing to-day, that shown above (1) is found in India, while the other inhabits Africa. Peacocks (2), well-known for the gorgeous tail of the male bird, and the hornbill (3) are characteristic of the varied bird life of the region. The Malay tapir is shown in (4), and (5) is the gibbon, the only one of the anthropoid apes to walk upright like man. The giant panda (6) is one of the rarest animals in the world, and found only in the bamboo jungles of western China. The komodo dragon (6) is the nearest living approach to the fire-breathing dragons of mythology.

Photos: Planet, Topical, Photopress

the Tropic of Cancer, and the islands of Madagascar, Bourbon, Mauritius, Rodriguez and the Seychelles. West, south and east it is bounded by ocean, and in the north by deserts.

Animals peculiar to this region include the gorilla, chimpanzee, several baboons, the majority of the lemurs, the African elephant, the hippopotamus, several species of rhinoceros, the zebra, quagga, giraffe and okapi, more than seventy species of antelope, the civet, hyena, and the aardvark (Cape anteater). Amongst birds such forms as the plantain-eater, secretary-bird, crane, flamingo and hornbill are distinctive. Vultures, eagles and other birds of prey are common.

The lion, leopard and ostrich are characteristic but extend into the adjacent Palaeoarctic and Oriental regions. The golden moles are confined to the Cape of Good Hope. The river-shrew and the elephant-shrew are peculiar to the region. Equally striking is the absence of groups such as bears, moles, deer, goats and sheep, that are dominant in the Palaeoarctic.

The Island of Madagascar is noteworthy in that its fauna shows affinities with the Oriental and Neotropical regions. The island is characterized by its abundance of lemurs and insectivores and the absence of monkeys. Most of the other animals peculiar to Africa, lions, leopards, hyenas, zebras, etc., are also absent. The majority of Madagascar's mammals are endemic, only three out of twenty-eight species being found in Africa.

Oriental Region. This comprises the Indian Peninsula, Thailand, south-eastern China and part of the East Indian Archipelago, including Sumatra, Java, Borneo and the Philippines. The northern, western and eastern boundaries have already been mentioned. South-west is the Indian Ocean, while on the south-east the region is limited by an imaginary line, "Wallace's Line," which passes between the islands of Bali and Lombok, then through the Straits of Macassar, between Borneo and Celebes and finally to the east of the Philippines.

The fauna of this region is very diverse. Amongst mammals there are the orang-utan, gibbon, the siamang, and several lemurs, amongst which the *Tarsius* is found in Sumatra and Borneo and the loris in India. The tiger, which, through China, extends into the Palaeoarctic, several bears, the Indian elephant, the Indian tapir, the Malay tapir, the scaly anteater, three species of rhinoceros, the komodo dragon, the mouse-deer, the tree-shrew and the panda, are all characteristic animals.

Prominent among birds are the peacock, Argus-pheasant, mynahs, jungle-fowl, green bulbuls, hornbills and broadbills. The rough-tailed burrowing snakes, the king-cobra and wart-snakes are common.

Australian Region. Australia and Tasmania are striking in their almost total absence of Eutheria, the only members of which found there being the cosmopolitan bats, rats and mice, and the Australian wild-dog, or dingo, which was probably introduced by the natives. With these exceptions the fauna consists of Marsupials and Monotremes. The latter occur nowhere else, while a single family of the former, the opossums, occurs in South America.

The Marsupials exist in the most diverse forms, adapted to different modes of life. Carnivorous, herbivorous, burrowing, arboreal and terrestrial types are found. Typical Marsupials are the kangaroo, wallaby, wombat, bandicoot, phalanger and koala. The zebra-wolf and Tasmanian devil are confined to Tasmania.

The Monotremes comprise three animals, the duck-billed platypus, the spiny ant-eater and the porcupine ant-eater.

The birds are equally peculiar. They include cassowaries, black swans, emus, bower-birds, lyre-birds, kookaburras and brush-tongued lorries. Also there are numerous distinctive parrots, king-fishers, pigeons, snakes, frogs and lizards.

The Austro-Malayan sub-region, which includes New Guinea and the other islands lying south of "Wallace's Line," is very deficient in Marsupials when compared with Australia. The only non-marsupial mammals are a wild pig and a curious rat found nowhere else.

The Polynesian sub-region consists of the innumerable islands lying east of the Austro-Malayan group, the most important being New Caledonia, Fiji, New Hebrides, Friendly Islands, Samoa and the Hawaiian (Sandwich) Islands.

Though the fauna of these islands is very heterogeneous, they all agree in the absence of Mammalia, with the exception of bats. The bird fauna is very rich and shows close affinities to that of Australia.

New Zealand Region. In many respects this region is one of the most remarkable. It includes the islands of New Zealand proper and the nearby Kermadec Islands to the north, Chatham Islands to the east and the Bounty, Antipodes, Auckland, Campbell and Macquarie Islands to the south.



ETHIOPIAN REGION

The chimpanzee (1) is probably the most intelligent of the anthropoid apes. The giraffe (2) is the tallest living animal and is dumb. The lemur (3) is characteristic of Madagascar, but is also found in India. The hippopotamus (4), lion (5), and leopard (6) are well-known African animals. Tortoises (7) and antelopes (8) are very common. The ostrich (9) is the largest living bird and is flightless. The African elephant is shown in (10) (note the large ears as compared with the Indian elephant). The okapi (11) is a rare and curious looking animal found in the Belgian Congo.

Photos: Erysene; Plant; Central; Tropical, Sport and General



AUSTRALIAN REGION

The koala (1) the original "Teddy Bear" was, until action by the Australian Government in danger of extermination. The kangaroo (2) is the best-known of Australia's animals. The lyre-bird (3), bower-bird (4) and kookaburras, or laughing jackasses (6), are examples of the rich bird life of the continent. The duckbilled platypus (5) is unique for it lays eggs and suckles its young.

Photos Australian Trade Publicity

The only endemic mammals in New Zealand are two species of bats, both peculiar to it. A rat, the Maori rat, is also present but was introduced by the Maoris.

The region is particularly rich in the variety and nature of its birds, especially with regard to flightless birds, which include the kiwis, the ground-parrot and the flightless duck of the Auckland Islands. Other unique birds are the tui, bell-bird, silver-eye, kaka parrot, the kea and the moneponk.

New Zealand possesses no snakes, but there

are many lizards. A reptile, the tuatara, and two species of frogs are peculiar to it.

Nearctic Region. North America, with Greenland, forms this region. North, west and east it is bounded by ocean, while the southern boundary is formed by a line of country stretching from Cape San Lucas in Lower California on the west and the Rio Grande del Norte in Mexico on the east.

The fauna of this region is not so striking as that of other, it shares affinities with the Palaearctic in the presence of wild cats, foxes,

wolves, weasels, bears, elks, deer, oxen, squirrels, marmots, hares, rabbits, beavers, voles, moles, thrushes, wrens, tits and finches.

Mammals which are characteristic of the Nearctic include skunks, raccoons, bison, moose and the grizzly bear. Amongst birds there are the blue-jay, the turkey-buzzard and the American eagle. Common reptiles are rattlesnakes, iguanas glass-snakes and the horned toads, while amongst the Amphibia, the axolotl, *necturus*, *siren* and *amphiuma* are noteworthy.

Neotropical Region. This region, comprising all South America, the tropical part of North America, the West Indies, the Galapagos Islands and the Falkland Islands, differs from all other regions in the luxuriance of its tropical forests, making possible a rich and varied fauna.

There are eight families of mammals confined: these include the prehensile-tailed monkeys, the blood-sucking bats, the sloths, armadilloes and the true ant-eaters. Other characteristic mammals are marmosets, cavies, agoutis, peccaries, chinchillas, the jaguar, llama, the American tapir and the kinkajou.

The bird fauna is particularly varied and includes toucans, rheas, sugar-birds, jacamars, motmots, quail-snipes, sun-bitterns, trumpeters, horned screamers and the hoatzin. The *heloderma*, a poisonous lizard, is found only in Mexico. Humming-birds, boas, rattle-

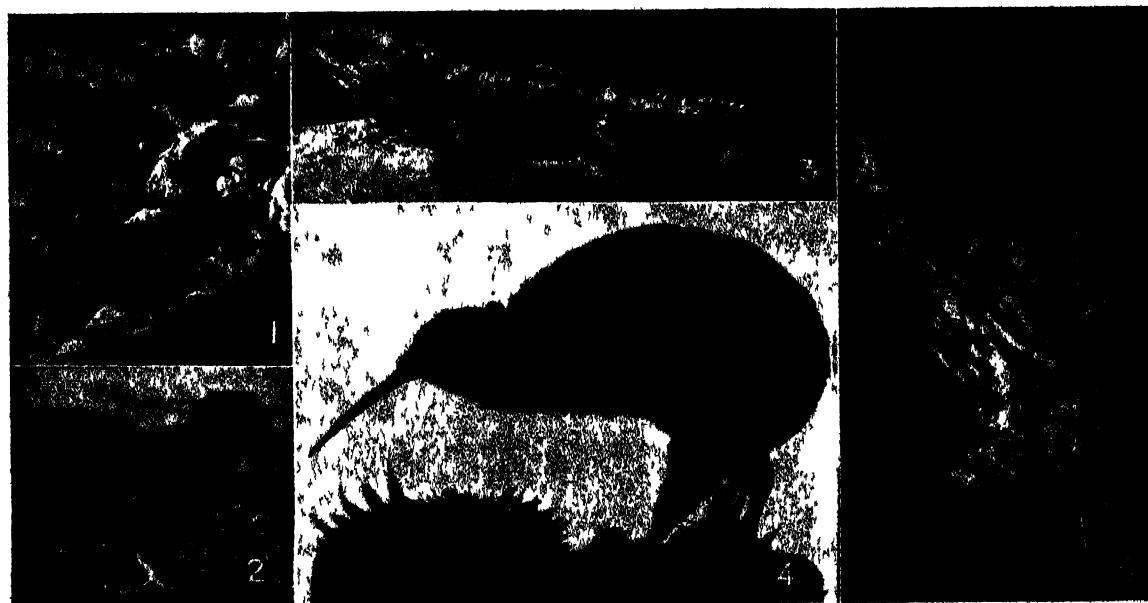
snakes, crocodiles, caimans and iguanas are very common.

Animals Common to Many Countries.

Among the mammals, bats, rats and mice are found in every country. Members of the families to which the following animals belong are found in all countries except Australia and New Zealand; cats, dogs, foxes, weasels, otters, swine, squirrels, hares and rabbits. Deer are common everywhere with the exception of South Africa, Australia and New Zealand, while the family Bovidae, including oxen, buffaloes, antelopes, sheep and goats, is absent only from South America, Australia and New Zealand.

Birds. A large number of birds are cosmopolitan. Among them are such forms as gulls, gannets, petrels, ducks, geese, swans, sand-pipers, snipe, thrushes, warblers, tits, crows, swallows, wagtails, cuckoos, king-fishers, pigeons, hawks, herons, plovers and owls. Wrens, finches, woodpeckers and vultures are absent only from Australia and New Zealand, while shrikes and cranes are missing from South America. Night-jars, swifts, spoonbills, ibises and storks are found everywhere except in New Zealand. Starlings are absent from North and South America and Australia.

Reptiles. The Colubrine snakes are absent only from Ireland and New Zealand, and



NEW ZEALAND REGION

The tui, or bell-bird (1) rivals the nightingale in the sweetness and richness of its notes. The rapacious kea (2) belongs to the parrot tribe and causes much concern to farmers through predation for sheep flesh. The unique tuatara (3) is the sole living relation of the gigantic reptiles of prehistoric times. The kiwi (4) is a flightless bird remarkable for the fact that its eggs are nearly as large as itself. The moneponk (5) is a common New Zealand owl, owing its name to its curious cry.

Photos High Commissioner for New Zealand

tortoises from Australia and New Zealand. Skinks and geckoes are universally distributed.

Amphibia. Toads and true frogs are absent only from New Zealand.

Distribution of Seals and Whales. The eared seals (sea-bears and sea-lions) are confined to temperate and cold shores of the North Pacific and to similar regions in the Southern Hemisphere. They are entirely absent from North Atlantic shores. The earless or true seals are found in cold and temperate regions in both the Northern and Southern Hemispheres. The walrus is found only in North Polar regions, while the narwhal inhabits the North Sea.

The "right" whales inhabit the cold and temperate seas of both Hemispheres, while the "beaked" whales are present in the Atlantic, Mediterranean, Indian and Southern Oceans. Sperm whales are confined to the tropical oceans.

Porpoises and dolphins are present in all

oceans, seas and large rivers. Manatees (the sea-cow) live on both shores of the Atlantic, while the dugong is peculiar to the Indian Ocean.

Distribution of Fishes. There are approximately eighty families of fishes and of these over fifty are universally distributed.

Cartilaginous Fishes. Sharks live in the surface waters of all oceans, while rays are confined to shallow waters. The man-eating sharks are found only in tropical seas. A current of warm water from the Tropics extends down the east coast of Australia, thus man-eating sharks are common there.

Bony Fishes. The sturgeon is found in the rivers of Europe, Asia and North America, the gar-pike in those of Central America.

Fresh-water bony fishes include the carp, pike, salmon, trout, and eel. The following are marine forms; cod, haddock, whiting, ling, sole, flounder, perch, mullet and mackerel. Some are shore-living or littoral, while others



NEARCTIC REGION

The iguana (1) is a rare lizard found in Mexico. The raccoon (2) is found only in Canada and the U.S.A. Probably the best known American bird is the American Eagle (3). (4) one of the many horned lizards found in Mexico. The opossum (5) is the only Marsupial found outside Australia. It lives also in both North and South America.

Photos: Photopress; Planet; Keystone

are surface-living or pelagic. The former usually possess brilliantly coloured skins, while the latter are grey or steel-blue above and white underneath.

Marine Fauna. Marine fauna can be divided into three types; those that are littoral, pelagic or abyssal (deep-sea).

Littoral. Here the sea-life is of greatest abundance, inhabiting rock pools and living amongst the masses of seaweed at the limit of low-tide. The fauna includes such forms as sponges, obelias, sea-anemones, corals, star-fishes, limpets, periwinkles, sea-slugs and oysters.

Pelagic. This is also known as the Plankton and consists of hosts of transparent invertebrate animals. Jelly-fishes and the larval stages of many littoral forms such as sponges and star-fishes are common.

Abyssal. The fauna living in the depth of the great oceans presents a curious appearance. Abyssal fish have usually enormous heads and mouths, distensible stomachs, long thin feelers, and are often phosphorescent.

Fresh-water Fauna. This is not as diverse as that found in the sea. Fresh-water fishes have been mentioned above. Lampreys, crayfishes, and fresh-water forms of shrimps and crabs are common inhabitants. Many reptiles such as crocodiles, alligators, caimans and water-snakes, are common in tropical lakes and streams. Ducks and swans amongst birds, and the otter and hippopotamus amongst mammals, live in fresh water.

Changes in the Land Masses. The present-day distribution of animals having limited powers of dispersal provides valuable information on the past relationships of continents and islands. If closely-allied species are found to-day in countries widely separated by ocean, it means that these countries were at one time connected. Animals that have found their way into countries through the agency of man are of course ignored in such a study.

It is necessary to know at what period in the Earth's history the animal first appeared. This can be determined from fossilized remains, which are also the best means of learning of



NEOTROPICAL REGION

Patagonian cavies (1) are curious animals resembling the guinea pig. The sloth (2) is helpless on the ground and spends most of its time hanging upside down from tree branches. Humming-birds (3) are numerous in the Amazonian forests. The llama (4) belongs to the same family as the camel, but is found only in South America. The rhea (5) resembles the ostrich and is flightless. It is confined to South America.

Photos: Topical, Sport and General, Fox, Planet Photopress

climatic changes that have occurred. Thus the presence of bones of hippopotami in the Pliocene rocks of England tells us it then enjoyed a sub-tropical climate.

In order to make clear the part played by fossils in a study of the past history of the Earth, let us consider the following example. South Africa and Madagascar are to-day separated by a wide sea. If the same animal is found living in both places, and fossil remains of the animal are also present in both, it can safely be said that the two land masses were joined when the animal arose. The earliest rocks in which the fossil remains are found gives the approximate time when this occurred. If, on the other hand, an animal is found to-day only on the mainland and no fossil remains of this animal are found on Madagascar, it means that Madagascar was separate from Africa when this animal appeared. Fossil remains will show when this occurred. In this way, and supplemented by other geological studies, the appearance or disappearance of connections between land masses can be determined.

The results show that the present-day relations between land and sea have not been constant, and there have been at various geological epochs great changes. Briefly, these changes have been as follows: During the



BIRDS THAT ARE COSMOPOLITAN

Species of the hawk (1) heron (2), thrush (3), and owl (4) are to be found in all continents

Photos *Topical, Photopress*

Primary Era there were two large land-masses, a southern continent stretching from South America across Africa, India to Australia, and a northern continent made up of Canada, Greenland, northern Europe and Siberia. During the Jurassic epoch these continents became broken up and three different land masses existed: North America and northern Europe; eastern Asia and Australia; and "Gondwanaland" (South America, South Africa, Madagascar and India). In the Cretaceous epoch North and South America became connected, and Antarctica became joined to both Australia and South America. In the late Cretaceous epoch, Australia became separated from Asia, but was still connected to South America through Antarctica.

During the Eocene and Oligocene epochs Antarctica broke away from South America and Australia, and "Gondwanaland" became divided, separating South America from Africa. By the end of the Miocene epoch, North and South America were joined. Australia, Madagascar and New Zealand were the only isolated land masses, the rest of the lands being in continuity. Finally in the Pliocene epoch North America separated from Europe and Siberia and the continents assumed much the same appearance they do to-day.

During the Jurassic and Cretaceous epochs, a chain of small islands stretched between

Madagascar and India, forming the so-called Continent of "Lemuria." New Zealand is the earliest isolated land mass, being finally separated in the late Cretaceous period.

Distribution of Some Selected Groups. The fossil evidence shows that Marsupials existed in the past in Europe and North America, from whence they spread through South America and Antarctica to reach Australia. When the more highly developed Eutheria appeared, the primitive Marsupials could not compete with them. The Eutheria did not reach Australia, as this was then isolated, and the Marsupials were able to thrive there and give rise to the wide variety of Australian Marsupialian life. Neither Marsupials nor Mammals ever reached New Zealand since this was isolated before the rise of either.

Earthworms. The *Acanthodrilus* group of earthworms is found to-day in South America, Africa, Madagascar, New Caledonia and New Zealand. This distribution roughly corresponds with that of the ancient continent of Gondwanaland.

Crayfishes. The crayfishes of the Southern Hemisphere belong to the family *Parastacidae*, while those of the Northern Hemisphere belong to a different family, the *Potamobiidae*. No members of either family are found in the opposite Hemisphere.

Peripatus. This is the sole surviving representative of an ancient order of insects. It is found to-day only in Australia, Tasmania, New Zealand, Africa and some parts of South America.

The Intervention of Man. It must be remembered that animals and plants living in any locality have been evolved through a long and gradual process of natural selection and that, in their relationships with each other, a harmonious balance has been reached. Each animal and plant is affected by, and affects, other animals and plants and usually no one species has any supernormal ascendancy, being kept in check by its natural enemies. If, however, a new animal or plant is brought in, it may, in the absence of any natural checks, spread at such a rate that it becomes a pest. Man has unthinkingly transferred numerous animals and plants from their homes into foreign countries, with disastrous consequences.

The introduction of rabbits to Australia is a familiar example. The Mediterranean fruit-fly, alfalfa weevil and Japanese beetle are amongst the numerous insects that have found a home in North America, and cause annually enormous damage to agriculture. Man has also introduced into every country where life for them is possible his domesticated animals and cultivated plants. Thus sheep, cattle, dogs, cats, goats, pigs, etc., are common to-day in practically every country.

Distribution of Flora. Amongst plants, as with animals, there is a constant struggle for existence, and the plants that are successful in



SEA-LION

One of the "eared" seals found only in temperate and cold regions of the North Pacific and the Southern Hemisphere

Photo: Fox

growing in a particular locality are those that are more perfectly adapted to all the factors of the environment. These factors fall into four main groups: (1) Physiographic factors, including altitude, the slope of the land and the exposure to light and wind; (2) Climatic factors, including temperature, atmospheric humidity, light and rainfall; (3) Edaphic factors, including the chemical and physical nature of the soil; (4) The interrelationships of animals, plants and man.

As examples of the last may be instanced the effect of vegetation on the distribution of Primates. These animals are dwellers in tropical forests and the area in which they live is limited by the range of the forest. Frugivorous birds, or those (like the humming-bird) that sip nectar, are dependent on the existence of the vegetation to which they are adapted. The whole flora and fauna of any locality are so closely bound together that any change in one or the other may have great effects on the whole. Everyone knows of the results of the introduction by man of rabbits and prickly pear into Australia.

The factors that have the most direct



WALRUS

It is found only in the north polar region; note the large and characteristic tusks

Photo: Photopress

influence on plants are the climatic factors. It is common experience that tropical plants cannot be grown outdoors in a temperate climate like that of England. Most plants prefer temperatures lying between 20° Centigrade and 30° Centigrade, but many are adapted to withstand very high or very low



DATE PALM

The palm which furnishes the edible date is common in tropical countries
Photo, Keystone

temperatures. The temperature of any locality depends on its latitude, its height above sea-level, its distance from the sea and other factors (see Climate and Weather).

In each Hemisphere there are four zones: (1) The Tropical zone, lying between the tropics with an annual temperature of between 26° Centigrade and 32° Centigrade; (2) A warm temperate zone, annual temperature between 13° Centigrade and 25° Centigrade. The differences between summer and winter are more marked; (3) A cool temperate zone, annual temperature between 5° Centigrade and 15° Centigrade, with more extreme differences between summer and winter; (4) Arctic or Antarctic zone, surrounding the Poles.

Similar zones can be recognized in passing from the base to the top of a high mountain, that at the top corresponding to the Arctic zone and known as the Alpine zone.

The environmental factors make up what is termed the habitat, and in each of the above zones there can be recognized particular types of plant communities, the habitats of which resemble one another. Though the plant community of one habitat may differ widely from that of a similar habitat in another locality in the nature of the species and genera of plants, the two communities will show the same external form of vegetation, due to adaptation to similar external conditions. Thus in each zone (with the exception of the Arctic) there are communities that make up forests, woodlands, marshes and grassland. Also there are those that are found in deserts, on the sea-shore and living in water.

Though similar types of habitat are found all over the world, the plants contained therein do not always belong to the same species, genera, or even family. For example, watercress was not found in New Zealand before the white man introduced it from Europe. The hyacinth is common in England but is not found in Germany, and similarly the foxglove is absent from Switzerland.

The present distribution of plants on the Earth's surface is determined by the same factors that affect the distribution of animals; the place of origin of the plant, its means of dispersal, and the barriers to migration. In this respect the past configuration of land masses is important. The dispersal of a plant depends on the facilities for spreading of the seed. Some seeds, bearing plumes or wings, are carried by the wind. Water is an important agent in dispersal, and seeds can be transported long distances by this medium. Often seeds from the West Indies are carried by the Gulf Stream to the shores of England. Birds disperse seeds which may be present in the soil adhering to their feet and plumage. Many fruits and seeds bear hooks and spines whereby they become entangled in the coats of animals. The barriers to the migration of plants consist, in the order of their importance, of mountain ranges, deserts and oceans.

Earth's Flora. In studying the distribution of plants, three primary divisions, marked out by the Tropics, can be recognized. These are a North Temperate Zone, a South Temperate Zone and a Tropic Zone. Each of these can be divided into sub-regions, the flora of each sub-region having some special characteristics of its own.

North Temperate Zone. This is characterized by catkin-bearing trees, such as chestnuts,

beeches, hazels, willows and oaks; by its pine trees; and by its profusion of herbaceous plants, such as buttercups, stocks, roses, peas, etc.

Arctic Sub-region. The area surrounding the Pole and bounded southwards by the Arctic Circle. The vegetation is scanty and is adapted to the cold conditions. Trees when present are stunted in growth and consist mainly of birches and junipers. Most of the vegetation consists of grasses, mosses and lichens, forming what is known as the tundra. Saxifrage is common. The flora on the tops of mountains is composed of the same types as above.

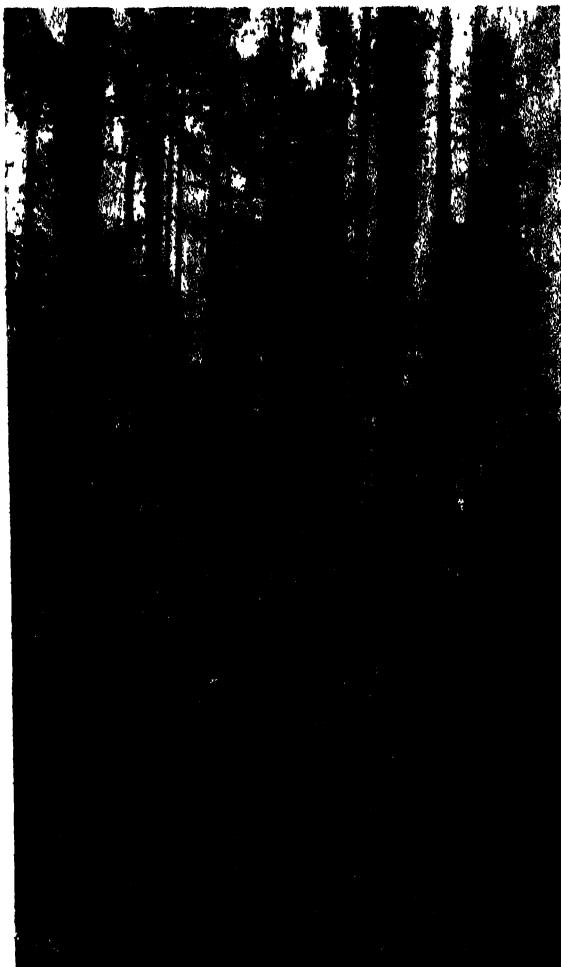
Intermediate Sub-region. This is made up of the plains of Europe and Siberia and the prairies of North America. The herbaceous flora is rich, with well-marked differences between the Old World and the New. In the Old World there is a profusion of such forms as the wallflower, shepherd's purse, sweet-william, hemlock, primrose and nettle. Representatives of these forms are rare in America, where, however, there are numerous species belonging to such families as Compositae, Polemoniacace and Hydrophyllaceae.

The conifers and deciduous trees of this sub-region are very characteristic. They include pines, hemlocks, larches, silver-firs and spruces. Among the pines are the Weymouth pine (eastern North America), Bhotan pine (Himalaya), Arolla pine (Switzerland) and the Scots pine (Scotland). Trees that are common to the New World and the Old include chestnuts, beeches, hazels, hornbeams, birches, elms, alders, ashes, willows, poplars, oaks, laurels, planes and aspens.

Mediterranean-Oriental Sub-region. This comprises the countries bordering the Mediterranean, the whole of Africa north of the Sahara, Asia Minor, Iran, the Azores and the Canaries. The flora is very luxuriant and this region has been the home of cultivated plants such as the date, vine, mulberry, fig, cherry, bean, pea, lentil, radish, cress and the cereals (wheat, oats, rye and barley). Other characteristic plants are the oleander, holm oak, ground palm, myrtle and bay. The forests are made up of evergreen conifers and oaks. In Morocco the argan tree is very common.

China-Japanese Sub-region. Common plants in this region include such forms as rhododendrons, primulas and saxifrage. The more characteristic plants are the tea-plant, rice-plant and sago-palm.

Mexico-American Sub-region. This includes the greater part of the United States and Mexico to the Tropic of Cancer. There are differences between the east and the west. In the west there are two species of sequoia, the Wellingtonia and the Redwood, and also the Douglas fir, the Sitka spruce, Pacific cedar



SWEDISH PINE FOREST

The pine is more common in the North Temperate Zone than in the South

Photo: Swedish Travel Bureau

and the Western hemlock. The drier western areas contain numerous cacti, the American aloe, the yucca and several palms of a subtropical nature.

In the east characteristic plants are the deciduous cypress, magnolias, tulip-trees, myrtles, laurels, oaks, maples, sage-brush and hickory. Characteristic of Mexico are the creosote-bush, acacias, fan-leaf palm, agaves, logwood, ahuehuete and the saponaria tree.

South Temperate Zone. The flora here is more specialized and less continuous than that of the north.

South African Sub-region. There are no large forests owing to the deficient rainfall. Coarse grasses are characteristic of the tablelands. On the plains the bush is found, consisting of stunted mimosas, acacias, euphorbias, wild pomegranate and bitter aloes. Orchids are common and amongst these are the arum-lily and the white everlasting flower of the Cape. The welwitschia is unique. Conifers are not common and the cacti of the New World are replaced by the related euphorbias.

Australian Sub-region. This includes Australia, Tasmania, New Caledonia and New Zealand. In Australia the dominant plants are members of the bean family, including the acacias (absent from New Zealand). Australian forests are noted for their profusion of gum trees, the eucalypti, including red gum, Mallee scrub, ironbark and jarrah. The eucalypti are absent from New Caledonia and New Zealand. Other characteristic Australian trees and plants include the mahogany, turpentine, red cedar, honey-suckle, wattle, needle-bush and Morton Bay pine. Palms are poorly represented but conifers are common.

The New Zealand flora shows many similarities with that of South America, especially in the presence of fuchsias, calceolarias and veronicas. Endemic trees include the kauri, rimu, matai, puriri, totara, kahikatea and the manuka shrub.

South American Sub-region. The region contains a large number of endemic species but shows resemblances to the Mexico-American sub-region. On the plains numerous grasses are found, hard grass (*pasto duro*), soft-grass (*tierno*) and pampas grass. Chanar (thorny bush) and cacti are common. The forests on the plains consist mainly of shrubs such as algarrobo, tala and acacias. Pine, cedar, witer bark, laurel and calden are common trees. On the highest slopes of the Andes an Alpine flora is present, while on the lower slopes the forests consist of Antarctic beech, oaks, cedars and pines. Palms are few in number.

Antarctic-Alpine Sub-region. This is the complement of the Arctic sub-region, but contains fewer species. Grasses, mosses, lichens and stunted trees make up the flora.

Tropical Zone. The richest zone in the profusion and variety of its plant life, a profusion seen at its maximum in a tropical rain-forest such as that of the Amazon basin.

African Sub-region. The flora has an isolated character. Palms are strikingly few, but ferns and orchids are common. Mangrove, baobab, and bombax trees are common. Among timber trees are found species of pine, cedar, ebony, stinkwood, sneezewood and ironwood. Tea, cotton, sugar, tobacco and rice are the chief cultivated plants.

Indo-Malayan Sub-region. This comprises the Indian and Malayan Peninsulas, Indo-China, southern China, Malay Archipelago, New Guinea and Polynesia. The commonest plants are species of orchids, while figs, laurels, myrtles, nutmegs and oaks are numerous. The region is extremely rich in the number of bamboos it possesses, including the sugar-cane. Plantains, ferns and palms are also found.

South American Sub-region. Orchids are the most numerous species, while the Amazon area is the richest in the world in palms (the coconut palm has probably spread from here to Polynesia and elsewhere). Characteristic plants are bamboos, ferns, rubber plants, cotton, mandioca, pineapple, maize, cinchona, ipecac, vegetable ivory, cocoa plant and Paraguayan tree. Tropical plants introduced and extensively cultivated include coffee, banana, sugar-cane and oranges. The araucarian pine is characteristic of the high tablelands of southern Brazil.

Desert Vegetation. A desert region is one where the rainfall is less than eight inches per annum. There are five such regions in the world: (1) A belt stretching from the Sahara through Arabia, Iran, Turkestan and Tibet to the Gobi desert in Mongolia; (2) Middle and Western Australia; (3) South-west Africa; (4) The south-west of the United States of America and northern Mexico; (5) Parts of Patagonia and the Argentine.

Plants growing in these regions are all adapted to conserve water. The stems are swollen, and the leaves may be reduced and spiky as in the yucca, or absent, being replaced by spines, as in the cacti of America and euphorbias of Africa. The leaves may also be thick and spiky and covered with water-tight epidermis as is seen in the American agaves and African aloes. Desert vegetation is usually patchy and stunted, consisting of sage-brush, artemisias, and wiry tussocks of grass, cacti and euphorbias.

Aquatic Vegetation. There are two main divisions, marine and fresh-water, the vegetation in each being more uniform than on land.

Two kinds of aquatic flora exist, the fixed or benthos and the floating or plankton. The benthos consists mainly of Algae, comprising the numerous varieties of seaweeds, while the plankton comprises such forms as diatoms.

tion originated in the Northern Hemisphere and spread gradually southwards. The climate then was sub-tropical, but when it became cooler, the more tropical forms were driven southwards while those that persisted became



CHARACTERISTIC VEGETATION OF THE ENGLISH COUNTRYSIDE

The photograph was taken at Barkham in Berkshire

Photo Reid

Fresh-water Algae such as spirogyra, vaucheria and numerous grasses make up the benthos. Unicellular Algae such as chlamydomonas and haematococcus are common in the plankton.

History of Plants. The present distribution of plants and the evidence derived from the study of Palaeobotany shows that vegeta-

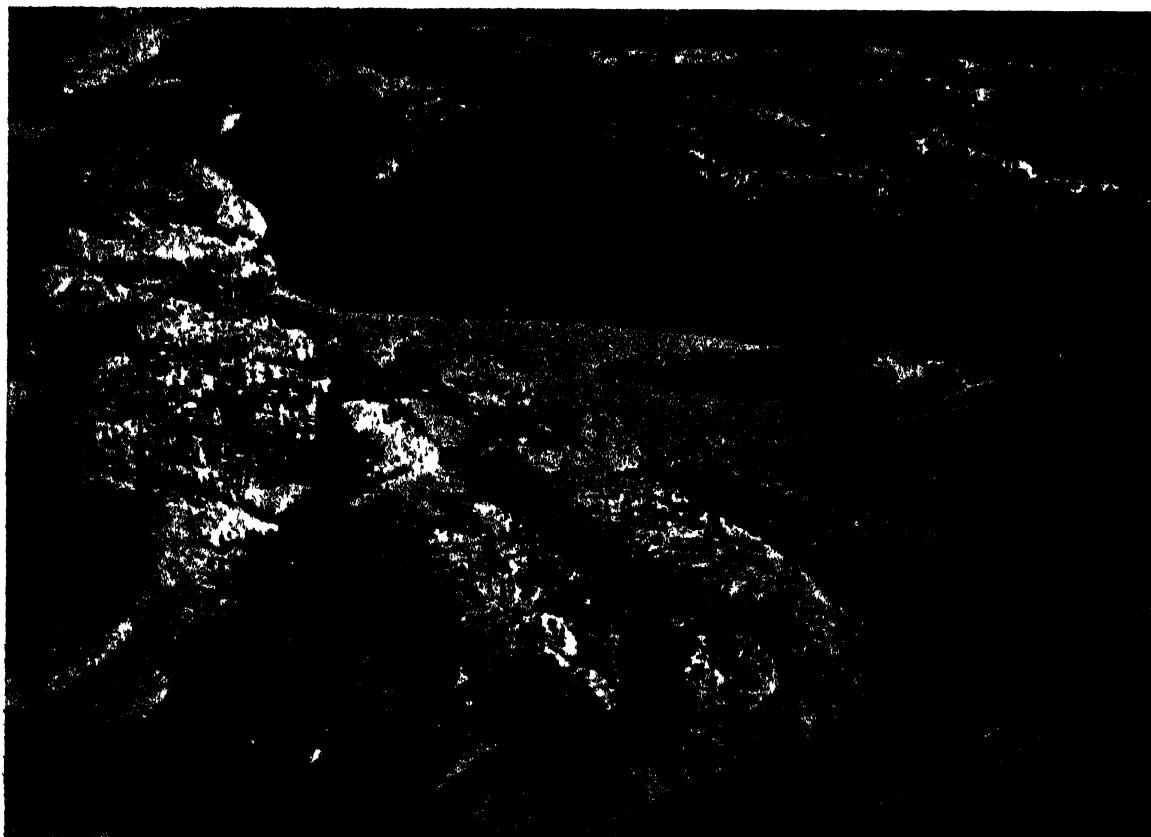
adapted to the more temperate conditions. The Glacial period exterminated a large number of temperate types and produced a more southward extension of Arctic forms. Through the Tropics, vegetation spread to the Southern Hemisphere, probably by way of the mountain ranges running north and south through the Americas.

ARCTIC AND ANTARCTIC LANDS AND SEAS

IT is not an easy matter to give a definition of Arctic Regions, but in no geographical sense can all the area lying north of the Arctic Circle be considered to be Arctic. That circle merely marks the equatorial limit of the zone in which the sun is never more than $23^{\circ} 30'$ above the horizon, a zone within which there is at least one period of twenty-four hours in the year during which the sun does not set, and one equal period during which it does not rise. At the Pole itself there is a six months day and a six months night. Perhaps the polar limits of tree growth on land and of drifting ice in the

sea form fairly satisfactory limits to Arctic regions, since these limits imply certain climatic and other characteristics. In this book, however, the northern parts of Europe, Siberia and Canada, except their islands, are omitted from Arctic Regions and included with the descriptions of lands with which they are contiguous.

The larger part of the Arctic Regions consists of a deep and wide sea, with an area of about 5,400,000 square miles, from which branch or minor seas project southwards into the surrounding continents. Such seas are the Kara Sea, White Sea, Barents Sea, Baffin Bay



GREAT BEAR LAKE, ARCTIC CANADA

Aerial view of radium mine at Labine Point

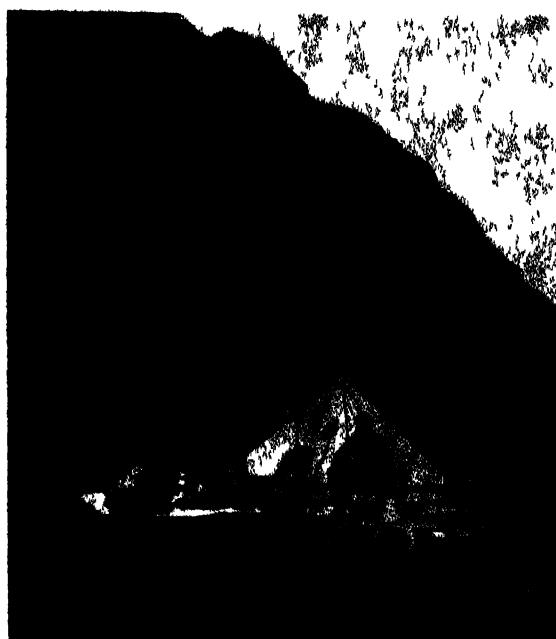
Photo Eldorado Gold Mine Ltd., courtesy Canadian Official News Bureau

and Hudson Bay. It should also be noted that the Arctic Sea or Ocean communicates by the wide and deep Greenland Sea with the Atlantic, and by the narrow and shallow Bering Strait—thirty fathoms deep—with the Pacific. The Greenland Sea, however, has a submarine ridge at an unknown depth across its northern limit and another, the Faeroe-Icelandic ridge, at a depth of about 1550 fathoms, across its southern limit, joining the shallow bed of the North Sea via the Faeroes and Iceland to the coasts of eastern Greenland. Thus the deeper waters of the Arctic basin are cut off from the Atlantic as well as from the Pacific.

Pack-Ice. The surface waters of the Arctic Ocean freeze in winter and the ice, under the influence of currents and winds, forms larger or smaller floes. These are known as pack-ice. They drift under the influence of a current which seems to be rotatory, with strong southern offsets towards the Kara, Barents, Greenland and Bering Seas. These southern currents, deflected by the Earth's rotation, press against the eastern sides of Novaya Zemlya, Spitsbergen, Greenland and eastern Siberia and, to a greater or less extent, force the pack-ice against those coasts. In summer little new ice forms, and there is some melting in the sun. Pressure is relaxed and lanes of open water occur among the pack, but strong winds at any season may cause pressure and piling up of the floes one upon another.

A floe of one year's growth may be five or seven feet thick, but after several years' accretions of ice, may be double that thickness. Sea-ice is nearly always covered with some snow, so never appears smooth and dark. On sea-water freezing the salts are precipitated, so that pack-ice is relatively fresh. It is the pack-ice that impedes the exploration of the inner polar regions by ship.

The shallow water edge, or the continental shelf, of the Arctic Sea is unusually wide and on that edge lie a number of islands and archipelagoes which may be regarded, geologically, as detached portions of the adjacent continents. Such are Greenland, the many Canadian Arctic islands, Wrangel Island, the New Siberian Islands, Northern Land, Novaya Zemlya, Fridtjof Nansen Land (Franz Josef Land), Svalbard (Spitsbergen) and others. Some of these will be described later. In the heart of the Arctic Sea there are no islands, in spite of various rumours. There seems, on the contrary, to be a fairly uniform depth of about 2000 fathoms.



AN ARCTIC ENCAMPMENT

Photo R. N. Rudmose Brown

Plant and Animal Life in the Seas. The Arctic, like the Antarctic, seas are singularly rich in plant and animal life. The reasons may be traced to peculiar physical conditions. All sea-water contains many salts in solution which are required for plant growth. Among the most important are nitrates and phosphates, derived from the decomposition of organic matter. Surface waters are more favourable to plant life than deeper layers, owing to the stronger light which is essential to the growth of plants. Now in polar seas the surface layers are continually sinking through increase of density, by reason of cooling in contact with cold air, and being replaced by layers from below with a further supply of plant food. In other words the surface layers which are the habitat of plant life are perpetually manured from below. Compare the lack of this revitalizing in tropical seas where the surface layers are warmed and thus expand, remain on top and consequently become exhausted of nutritive substances.

Other contributory factors to plant growth in cold, compared with warm, seas are the greater amount of carbon dioxide in solution and the slower action of organisms which render useless to plants the nitrogenous compounds.

The principal plants of polar seas are diatoms, floating unicellular organisms which



ANTARCTIC: ADELIE PENGUINS

Photo: R. N. Rudmose Brown

may be so abundant as to colour the sea as green as a meadow. On this mass of plant life live small crustaceans, molluscs and the large Greenland whale. On the crustaceans live fishes and seals; on fishes live seals and on seals live bears. Thus is completed the web of life in Arctic seas.

Climate. Arctic climate is characterized by a long cold winter and a short but almost warm summer. The length of the winter varies even at sea-level, but seldom lasts more than nine months, which leaves about three months, June, July and August, for summer. But in June the snow has, as a rule, not yet gone, although sun temperatures are decidedly warm. Generally three months, or at least two, show a mean temperature of about 35° to 40° Fahrenheit with maxima of 55° and 60° Fahrenheit. Winter averages fall well below zero Fahrenheit, but rarely, except at high elevations, do they show greater cold than north-eastern Siberia, or even north-eastern Canada. Snow in winter and rain in summer are not as a rule abundant; a total equivalent of ten to twenty inches of rain is an average amount. The permanent snow-line is above sea-level and in places as high as 200 feet, but the surface soil rarely thaws to more than a foot in depth: below that depth the ground is permanently frozen.

Fog is common where open water abuts on ice or where cold and warm currents meet. Though calms are frequent, gales invade the Arctic regions and strong winds off lofty ice-covered areas are common. On the whole,

however, the Arctic climate, if cold, is bracing and stimulating, and has few of the drawbacks of an English winter.

Life on the Land. All Arctic land vegetation is low growing, except in south-east Greenland, and scattered. Mosses and lichens are numerous, but flowering plants are plentiful and there is no lack of colour in the short summer. There is, however, little of economic value except a few berries such as cowberries, cloudberry and crowberries. Any sort of agriculture is prevented if not by lack of soil at least by frozen subsoil and shortness of the growing season. Plants that thrive grow, flower and seed with amazing rapidity in the short summer and many, failing to produce ripe seeds, spread by shoots and runners. Thus annuals are rare among the Arctic flora.

There is sufficient herbage on most ice-free lands to support the reindeer or caribou, and more locally the musk-ox. The former feeds on lichen and willow leaves and the latter on grass and willow. In winter both use their broad hoofs to scrape away the thin snow that hides their food. Hares and lemming also occur and such carnivores as ermine, glutton and wolf, but all these are absent from lands east of Greenland. The fox is found everywhere, living well in summer on birds and eggs and poorly in winter on seal excrement and scraps left from the bears' feast. The polar bear is the symbolic animal of the Arctic, a rover on sea-ice stalking seals and only a rare visitor to land. The bears never hibernate, in spite of popular belief, and unless hungry or attacked are far less dangerous than is generally believed.

Lack of space prevents an account of the migratory birds that come north in summer and the sea birds that breed in the Arctic. The



SVALBARD: COTTON GRASS MOOR

Photo: R. N. Rudmose Brown

coasts ~~are~~ alive with bird life in spring and summer but winter birds are very few, ptarmigan, snowy owl, a raven, an eagle and a few other types in Greenland and Canada.

Sovereignty. From time to time explorers have made national claims to newly discovered land, but only rarely have such claims had reality, for they lacked the authority of the State. Now, however, all lands in the Arctic are under at least nominal, and in some cases effective, sovereignty. But this is mainly recent history and has had various origins. The first Arctic Power was Denmark, with her colonies in western Greenland. This land had been Norwegian from 1261 to the fifteenth century, when Norwegian interest and Norse colonies alike died. Denmark retained her interest in Greenland in 1814 when Norway left the Danish crown. In 1917 Denmark bought out any possible, though doubtful, United States claims in the far north at the time of the sale of her Virgin Island colonies to the United States and in 1933 the Hague Court of International Justice decided that Norway's claims to certain territories in eastern Greenland were untenable and that Danish sovereignty was applicable to the whole island.

Svalbard (Spitsbergen) has had a chequered political history. In the sixteenth and seventeenth centuries its value as a whaling base made Britain and the Netherlands wrangle over the sovereignty. When whaling lapsed no one cared until coal began to be important, at the end of the nineteenth century. Then all the western Powers began to show an interest, each jealous and suspicious of the others. But it was a happy land of anarchy, yet peace, even before the Powers eventually agreed, in 1919, to Norwegian sovereignty. Norway's archipelago of Svalbard includes Bear Island and Giles Land. Jan Mayen became Norwegian in 1930.

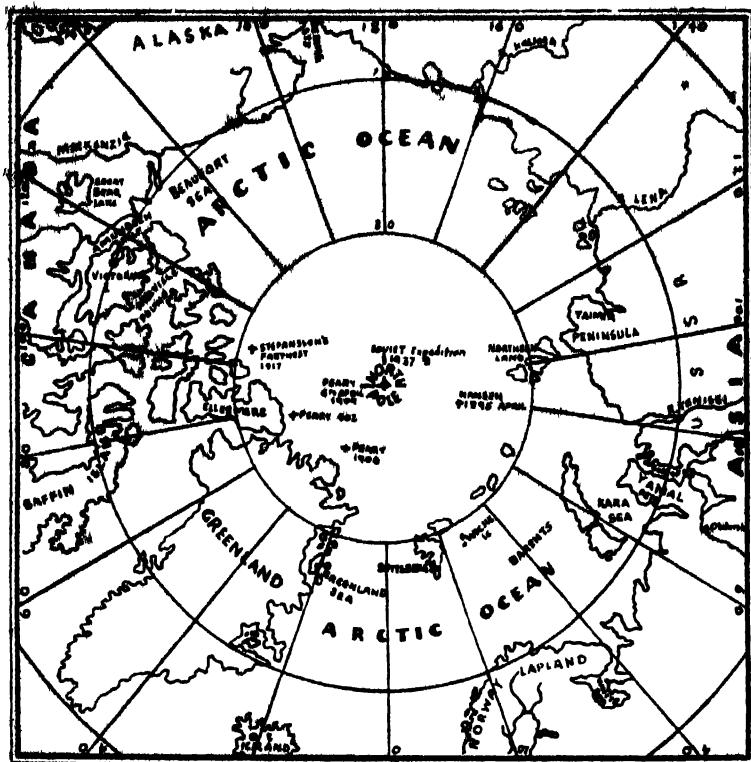
Russian sovereignty has slowly spread northward and by custom nearly all the islands north of what is now the territory of the Union of Socialist Soviet Republics had long been regarded as Russian when, in 1916, these claims were stated with precision: in 1929 Fridtjof Nansen Land was added. Canada claims all Arctic lands, except the corner of Greenland, between longitude 60° and 141° west. The United States of America has no Arctic claims outside Alaska. Not a single No Man's Land remains.

Arctic Exploration

A GLOBE or a map of north polar regions will show that they lie between the eastern and the western worlds, between the states of Europe and the older civilizations of the Far East. Herein lies the key to understanding the motives that prompted the real beginnings of Arctic exploration. The early Norsemen, the first real ocean voyagers, no doubt made several Arctic discoveries between the ninth and twelfth centuries. Thus they found Novaya Zemlya, Svalbard (Spitsbergen), the Barents and White Seas and Greenland. But each was an end in itself and to the Norsemen there was no problem of a route to regions beyond that stimulated the search for a seaway. Cabot's re-discovery of North America, for the Vikings had certainly found it long before, in his Cape Breton landfall in 1497, and Cortereal's sighting of Newfoundland in 1500, soon convinced men that these lands were not parts of the hoped-for Asia with its riches, but obstacles across the coveted route. A way past

them must be found. The Pacific was discovered early in the sixteenth century but although the call of the East became more insistent, the discovery by Magellan, in 1520, of a rival route to that of Vasco da Gama of 1498, delayed the serious attempt to find the North-west and North-east Passages.

The Muscovy Company of London led the way eastward in 1553, when Willoughby and Chancellor found the White Sea and Novaya Zemlya. In 1580 Pet and Jackman reached the Kara Sea and in 1584 a vessel reached the Ob mouth. But the way seemed to be barred by ice and efforts lapsed for a time. The north-west attempt began later but was more persistent. Frobisher began it in 1576, Davis advanced it in 1585-87, Hudson in 1610 entered the bay that bears his name, and Baffin in 1616 reached Smith Sound and latitude 77° 45' north. Then unpropitious prospects checked further attempts. Another possible way to the East was due north across the Pole:



Barents tried that way in 1596 and failed, but re-found Svalbard: Hudson in 1607 reached $80^{\circ} 23'$ north on the same route. This way too was barred by ice.

The Hudson's Bay Company, founded in 1666, had for one of its objects "the discovery of a new passage to the South Sea" but it was long before this search took shape. In 1771 S. Hearne of that Company reached the sea along the Coppermine River, and in 1789 A. Mackenzie, also of the Company, descended the Mackenzie River to its mouth. Already in 1778 the enterprising James Cook had sailed through Bering Strait and tried in vain east and west to find ice-free passages. But the discovery of sea to the north of North America re-awakened interest in the North-west Passage, and the search was resumed.

The British Government took an active part. In 1818 W. E. Parry, in reaching Banks Strait via Lancaster Sound, where ice blocked his way, nearly made the discovery. In 1829 J. Ross and J. C. Ross reached King William Land by sea and others, including J. Franklin, J. Richardson, G. Back, P. W. Dease, T. Simpson and J. Rae by this time had amplified the map of the coasts and islands of this part of the Arctic. Thus the time was ripe for a final great effort when, in 1845, the British

Government sent Sir John Franklin with *Erebus* and *Terror* to make the passage. Ships and their entire complements vanished. The search for them provided a powerful stimulus to exploration. It must suffice to note that J. Rae, in 1854, first solved the mystery and was followed by Sir L. McClintock and others.

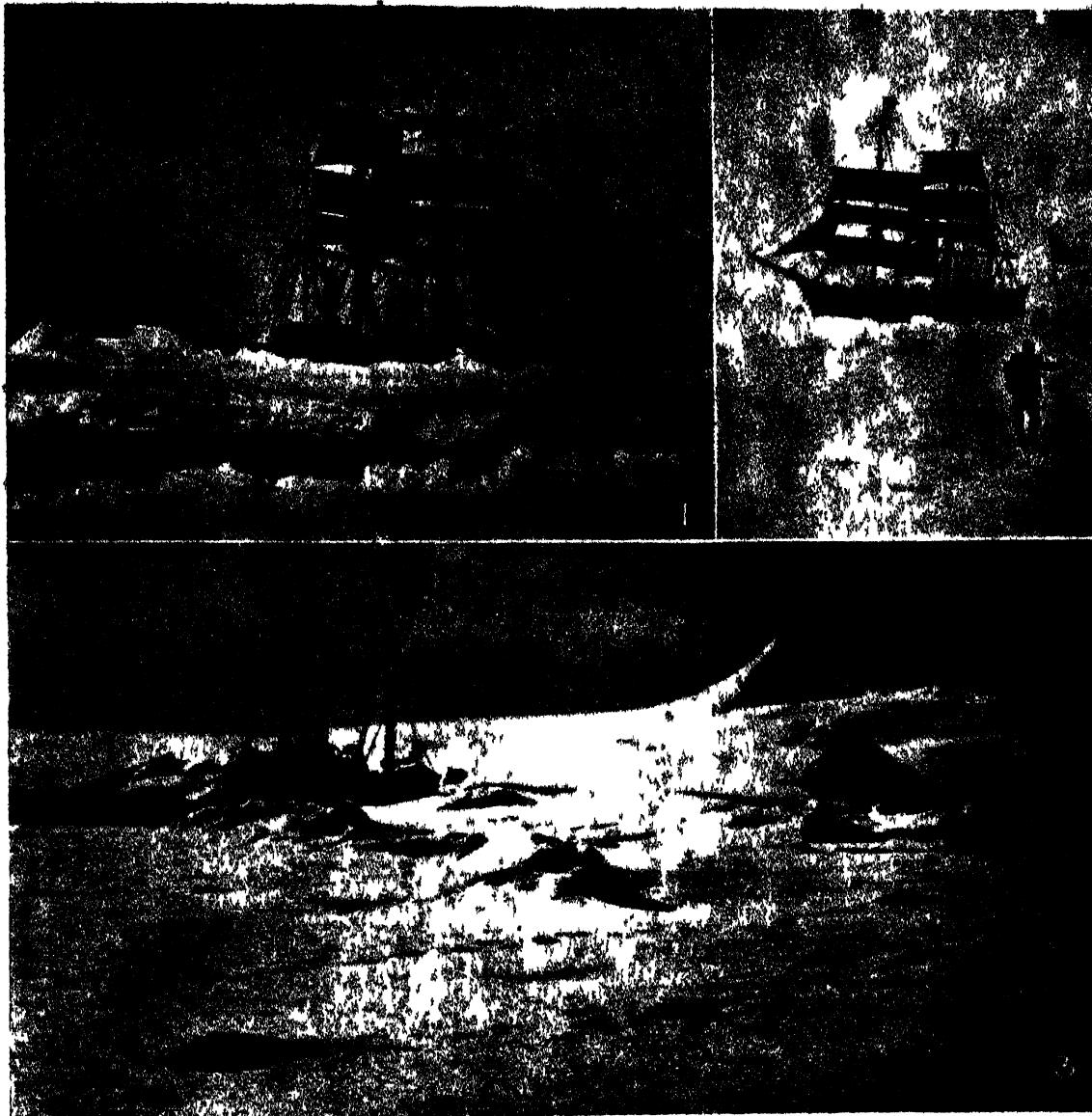
The North-west Passage was accomplished by Sir Robert McClure in 1851-53, in part by ship and in part by sledge from Banks Strait, Parry (Melville) Sound, Barrow Strait and Lancaster Sound, but the first ship to traverse it was R. Amundsen's *Gjøa*, in 1903-04, by way of Lancaster Sound, King William Island and Dease Sound. The passage proved valueless for commercial purposes.

Meanwhile the other possible routes across polar regions had their share of attention. The

polar route quickly lost favour as a possible way, but W. E. Parry, in 1827, reached latitude $82^{\circ} 45'$ north travelling with sledges from his ship. In those days the drift of the polar pack towards Spitsbergen and Greenland, with the consequent certainty of failure for any northward travelling party, was not realized. In 1872 C. Weyprecht and J. Payer tried in vain to make the North-east Passage, but found Fridtjof Nansen Land. In 1878-79 Baron A. E. Nordenskiöld took the *Vega* round the north of Europe and Asia to Japan. This route has



KING WILLIAM ISLAND: FRANKLIN CAIRN
Photo: Canadian Official News Bureau



EXPLORING IN THE ANIARCTIC PACK-ICE

1. Scott's *Terra Nova* in the Ross Sea 2. Bruce's *Srota* off Coats Land, in the Weddell Sea 3. Ellsworth & Wyatt Earp in the Weddell Sea Joinville Island is on the right
Photos Photopress, S M Bruce, Wide World

been followed since by exploring ships and icebreakers, but offers limited prospect of success to commercial vessels, though the western end is used in August and September for trade with Siberia.

Henceforth Arctic exploration ceased to have commercial ends in view. Indeed, from Franklin's day a strong motive had been the attainment of the Pole, and minor motives the elucidation of the unknown. The problem became one of finding a far northern land-base accessible by ship, from which sledges could

reach the Pole over what appeared to be an ice-covered sea. It was a period of hard slogging with man-drawn sledges, of much physical distress, and small gains won at great cost. The curse of scurvy, then a mystery dogged the explorers, and the tradition of hardship associated with polar climates caused inactive winter life, and resultant poor health. Some explorers used Greenland, others Ellesmere Land and others Fridtjof Nansen Land for their northern attempts. Controversy raged between the advocates of the various routes.

For nearly half a century the world was provided with tales of hardship, heroic endeavour and not infrequent disaster. This was the period of G. S. Nares, A. H. Markham, E. K. Kane, G. F. Hall, A. W. Greely, J. B. Lockwood, de Long, U. Cagni and others. The work of F. Nansen deserves special mention; he developed a new and successful technique when, in 1886, he first crossed the inland ice of Greenland, a feat accomplished since on many occasions.

Nansen adopted the principle of having no

by their own efforts they must travel over the moving floes to land and safety. This they did after reaching a record northern latitude of $86^{\circ} 5'$ north. Thus was made the first exploration of the inner polar regions and the last for many years. The persistent and eventually successful attempts of R. E. Peary to reach the Pole on foot began in 1902 and ended on 6th April, 1909.

The conquest of the Pole released explorers from the obligation of going to find it and allowed more attention to be given to explora-



R.S.S. "DISCOVERY II" AT ANCHOR IN
Photo: Colonial Office

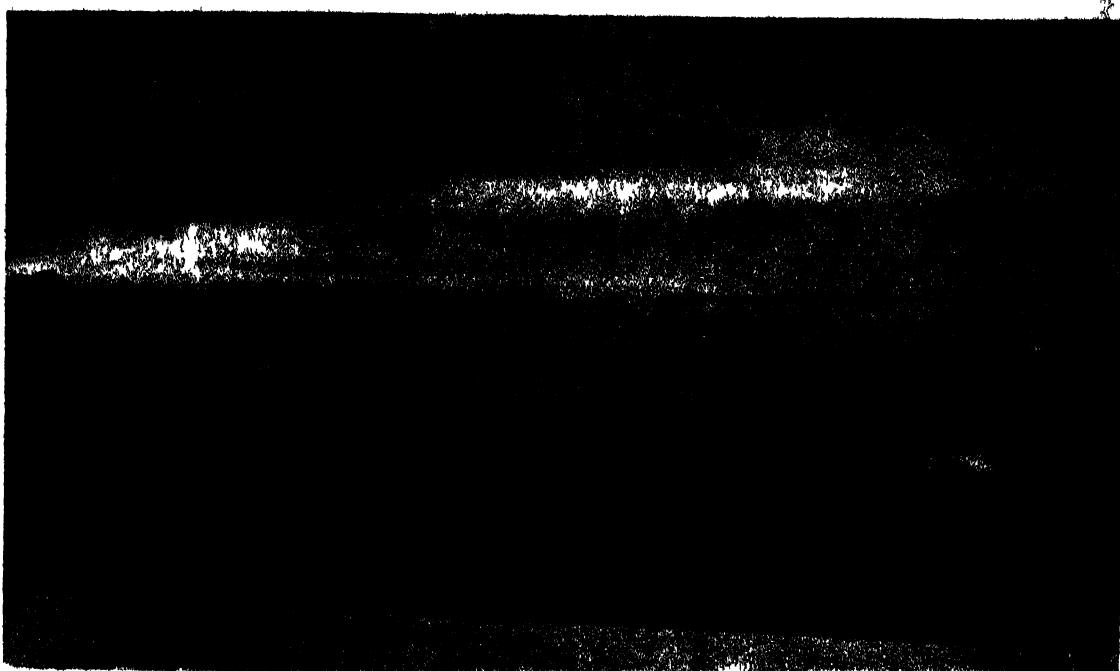
base on which to fall back and thus leaving no choice but to go on. Nansen's famous expedition in the *Fram*, 1893-96, was planned on comparable lines. Arguing that it was useless to battle against the formidable pack-ice of the Arctic Ocean in the hope of reaching a high latitude, he proposed to drift with the moving pack, which he rightly believed—contrary to the theories of his day—to be carried across the polar basin from Western Asia towards the Greenland Sea. Therefore he pushed his ship into the ice near the New Siberian Islands and allowed her to drift, helplessly, with no line of retreat. With the same dauntless spirit he and Johansen left the drifting ship, to push northward on foot to the Pole, knowing well that to regain a moving ship was impossible and that

tion of a less sensational but more useful kind. Such work was done by M. Erichsen (1900-08) in eastern Greenland, O. Sverdrup and G. Isachsen in the Canadian Arctic islands, R. E. Peary in northern Greenland, K. Rasmussen for many years in western and northern Greenland, E. Mikkelsen in eastern Greenland (1909-12) and a host of other Danes; also V. Stefansson (1906-18) in the Canadian Arctic Islands and by many others. An interesting and unexpected discovery was Northern Land (originally Nicholas Land) north of Cape Chelyuskin, found, in 1913, by Vilhjalmur.

Aerial exploration of the Arctic began long before the aeroplane. In 1897 S. A. Andree made a disastrous attempt on the Pole by balloon and his fate remained a mystery until

1930, when his diaries were recovered. It was not until 1925 that the Pole was reached by aeroplane by R. E. Byrd, a year after R. Amundsen had failed and narrowly escaped disaster. In the summer of Byrd's flight R. Amundsen with U. Nobile and L. Ellsworth was successful in crossing from Spitsbergen to Alaska in the airship *Norge* and in 1928 G. H. Wilkins covered the reverse course in an aeroplane. In 1931 two flights were made across Greenland. The *Italia* airship of 1928 introduced tragic disaster into the record of Arctic flying.

permanent Arctic observatories. A venture never before equalled in daring was the placing by aeroplane, in May, 1937, of a party of four men and equipment on the drifting floes at the North Pole. I. D. Paranin was in command of this party, whose camp and observatory gradually drifted south towards Greenland and down the east coast until, in February, 1938, they were rescued by an ice breaker in about latitude 70° north. The drifting Soviet ice-floe may be regarded as a development of Nansen's plan of forty years earlier.



SCOTIA BAY, SOUTH ORKNEYS, ANTARCTIC
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On the other hand two superb flights, though not of exploratory value, deserve mention as marking the triumph of the long-sought north Polar route between east and west. In 1937 V. Chekalov and two companions flew from Moscow to Portland, Oregon, a distance of 5400 miles in 63 hours, and a few weeks later M. Gromoff and two others flew from Moscow to California, 6300 miles, in 62 hours.

The pioneer work in the Arctic is finished, but there is much detail to fill in; this requires careful ground work, not hasty flights. The Russians have done an immense amount of work in their own Arctic territories, exploring the little-known Northern Land, Fridtjof Nansen Land, Novaya Zemlya and other groups and maintaining a score or more of

Greenland also has been the scene of intensive work, mainly by Danes and also by H. G. Watkins and his party (1930-31) in eastern Greenland, during which journeys were made on the ice cap, and by A. Wegener and others working into the ice-sheet from western Greenland. J. M. Wordie also is among the explorers of eastern Greenland. M. Conway, W. S. Bruce, G. Binney, A. R. Glen and many Swedes and Norwegians have intensively explored Svalbard, which has almost become a summer resort; while the Canadian Arctic has few secrets left to reveal.

Eskimo. Many races touch the Arctic in Europe, Asia and America, but the Eskimo are the only people that are wholly confined to the Arctic. They inhabit the Arctic coasts of

America from Alaska to Labrador, and most of the coasts of the Canadian Archipelago. Some are found in Greenland and a few in eastern Siberia. Throughout their domain they are of the same race, and linguistic differences are only in dialect. Their racial origin is somewhat obscure: possibly they represent a relatively late invasion from Asia, but, more

to an unusual environment. Seals and, to a less extent, reindeer and bears, provide clothing and rugs, bones provide weapons and tools, drift-wood and seal oil, fuel and light, and stones and snow the materials for dwellings. Naturally, as among all hunters, there is no widespread organization, and population is scattered. Want and famine occasionally occur, but as a rule the Eskimo are a happy contented people.

Contact for many years with the white man, from the days of the whalers a century ago, has altered the simple economy of the Eskimo. Few if any of them are now without iron and other things of European or American manufacture. And new and most effective weapons have made serious inroads on the supply of game, and so restricted the area in which the Eskimo can with safety live. Their numbers are undoubtedly declining.

Greenland. Greenland is the most extensive Arctic land, reaching nearer to the Pole than any other and extending as far south as latitude 60° north. In the main it is an old plateau of crystalline rocks, and all the lofty interior, except some high ranges near the east coast, is covered by an ice-sheet, rising in places to an altitude of 10,000 feet. This ice-sheet, which is the only great one in north polar regions, has an area of about 800,000 square miles. In a few places only does it reach the coast: generally it discharges by valley glaciers to fjords which dissect the ice-free margin of the island, a rocky belt varying in width from a mile to two hundred miles. On this rocky margin soil is scarce and vegetation scattered and generally lowly, though in the south-west there are small woods of birch and willow, and here and there meadows, more reminiscent of temperate than of polar lands.

There, in the south-west about A.D. 985, in the century of Greenland's discovery, Eric the Red founded his colonies of adventurous Norsemen from Iceland. By the thirteenth century there were probably nearly 300 families living in stone houses, keeping goats, a few cattle and even sheep and horses, hunting reindeer and seals and fishing in the fjords. Greenland had its churches and its cathedral. Every summer there were ships from the outside world to buy furs and ivory and to sell corn, wood, iron and textiles. In 1261 the colonies passed to Norway, but in two centuries' time were forgotten, and eventually languished and died, partly from want of nutriment and partly from unequal contest with the Eskimo.

When the Danes re-opened traffic with



JULIANEHaab, GREENLAND
1 and 2 Danish trading settlement 3 Ancient Norse ruins
Photos Professor H. B. Jenson

likely, they are derived from a primitive American Indian stock and spread from the northern plains to the Arctic islands, changing in the migration from reindeer hunters to seal hunters, attracted by the greater surety of subsistence that sea affords compared with land. They spread along the shores of the Arctic islands, eventually reaching Greenland in the extreme north.

No people show a more perfect adaptation

Greenland in the eighteenth century they found an Eskimo population on the west coast. The Eskimo had spread from the north, and a few had even reached the less attractive east coast. A lucrative trade in furs, skins, eiderdown and ivory led to Danish trading stations and missionary posts. To-day the Greenlanders, a name for the Eskimo with European admixture, live a more or less civilized life in some

numbers about 1300 compared with 20,000 on the west. There are also some two hundred polar Eskimos in the far north.

Only one mineral has become an article of trade. At Ivigtut is an important cryolite mine, a rare mineral used in the manufacture of aluminum. This is worked throughout the year by a Danish company, with Danish labour. Export, in the summer only, is to Kjøbenhavn



EAST GREENLAND SUESSEN, FRANZ JOSEPH FJORD

Photo M A Barnell

fifteen settlements, enjoying equality with all other Danish nationals, for in 1953 the old Colonial status was abolished and Greenland became an integral part of Denmark. A settlement consists of a dozen or more gaily painted wooden houses, a store, small wharf, church and probably a school. There are radio programmes in Danish and Greenlandic, and a free monthly newspaper is circulated. There are even old age pensions, and to all a yearly distribution of bonus derived from any profits on the sale of produce. At Disco Island there is an important scientific research station.

On the east coast there are only a few settlements, but Greenlanders are being encouraged to come to that side. The east coast population

(Copenhagen) and the United States. Large deposits of lead, first discovered in 1948, are in process of being exploited, however.

The development of cod and halibut fishing in Davis Strait, by vessels from France, Portugal and Britain, induced Denmark to open the harbour of Faeringehavn to foreign vessels. This is a good harbour, with moorings, repair shops and a hospital. Other harbours are closed to all except vessels with special permits.

In 1941 the U.S.A. took over the defence of the island and since the war, in co-operation with Denmark, has established a giant air base at Thule.

Canadian Arctic Islands. The archipelago of about half a million square miles may be

regarded as the partially drowned plain of Arctic Canada, with lofty islands, Baffin, Devon and Ellesmere, of ancient rock, in the east, and lower islands with newer rocks in the centre and west. The sea channels between the islands are very apt to be congested with pack-ice, even in summer, and this makes the North-west Passage valueless. Only the higher and larger eastern islands have any permanently ice-covered areas. The rest are clothed in rolling tundra, snow-buried in winter, but more or less clear in the short summer. Thus there are many reindeer, foxes, wolves and, in the north, musk oxen.

The verdancy and game of these islands gave V. Stefansson his idea of a "friendly Arctic." He suggested that these islands, as well as the northern plains of Canada, would prove useful grazing grounds for domesticated caribou, or reindeer and musk oxen. An attempt with Norwegian reindeer in Baffin Island failed, but attempts with Siberian reindeer, a hardier breed, in Alaska and the Mackenzie delta seem to promise success.

The archipelago is the chief Eskimo domain, and Banks and Victoria Islands are among the reserves allotted to these peoples.

Much of this archipelago was roughly explored in the course of the quest for the North-west Passage and the search for Franklin and his men, but detailed examination is relatively recent, and has been done chiefly by the Canadian Government, since control of the area passed from Great Britain to Canada in 1880. It now comprises the Franklin District of the North-West Territories and is under the care and control of the Royal Canadian Mounted Police. They have a number of scattered posts in the lonely islands and their patrols make journeys by sledge, ship and aeroplane. Thus the natives are protected from exploitation and demoralization by unauthorized traders, and the harm that was done in earlier lawless times is checked. The largest fur trading company is the Hudson's Bay Company. There are also some missionary posts. It is estimated that there are only about 16,000 Eskimo, whites and half-breeds in the whole of the North-West Territories, which include much of the mainland.

Svalbard (Spitsbergen). One of the most approachable of Arctic lands is the archipelago of Spitsbergen, now called Svalbard by its Norwegian owners. A branch of the mild North Atlantic drift sweeps northward on its western coast and tends to push back the pack-

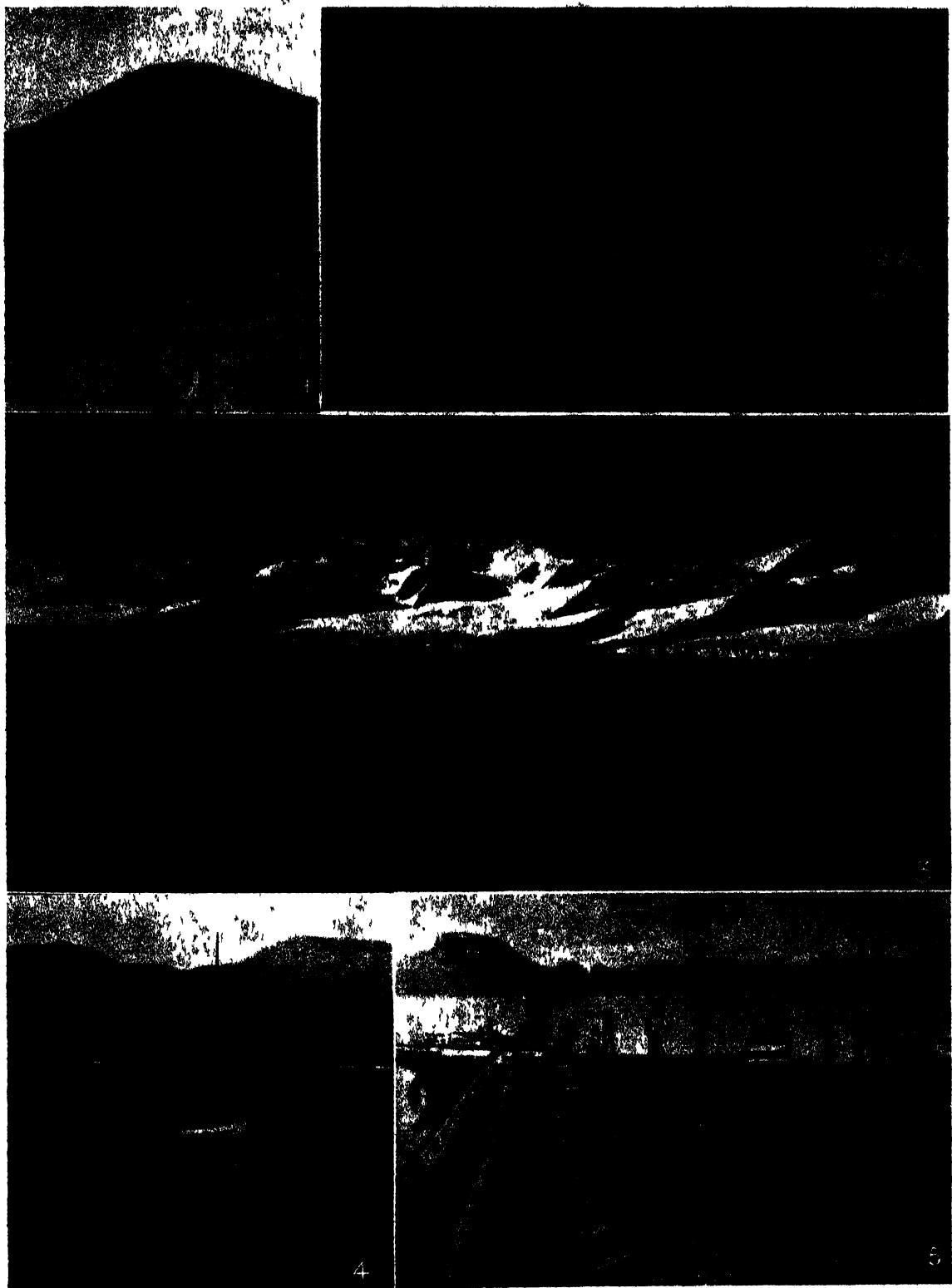
ice and so to permit approach by sea on that side.

The whole archipelago is about the size of Scotland and most of it is a faulted and dissected plateau of more or less horizontal rocks and flat topped hills, but in the west and north are older and much crumpled rocks, giving a rugged skyline. Heights of over 5000 feet are rare; there are many low-lying, but narrow, plains along the coasts and the branched fjords that penetrate the largest islands. Most of the plains are raised beaches. In North East Land glaciation is most marked, but elsewhere takes the form of valley glaciers and not of enveloping ice-sheets. The glaciers reach the sea and calve off in fragments of ice rather than large icebergs. But there are many ice-free valleys in the west coast and in the interior, occupied at their bases by deep and muddy glacial streams. In winter snow covers all the islands and temperatures are low. Summer is a period of much snow-free ground and many delightful warm days, with occasional periods of mist and rain, especially in the west.

Here and there are peat bogs and moss swamps with waving tufts of cotton grass, or meadow with buttercups and cuckoo flowers, and low hills bright with yellow, white and purple saxifrages. Even on exposed crags the Iceland poppy often thrives. There is colour in plenty in a summer landscape. But trees are entirely wanting and no crops can be grown. Reindeer, now preserved, are still to be seen and are at last increasing in number: foxes have been hunted almost to extermination, but the musk ox has been successfully introduced from Greenland. Polar bears are rare visitors, except when the pack-ice presses close on the coasts in winter.

In summer every sea-cliff is alive with nesting sea birds, loons, guillemots, little auks, puffins, many gulls, kittiwakes, terns and skuas. Geese and ducks are abundant. Many migratory birds, including the knot, turnstone, purple sandpiper, Lapland bunting, snow bunting, grey phalarope, little stint and others, arrive in spring. The ptarmigan and the rare snowy owl stay throughout the year. It may also be noted how the nesting of birds leads to the manuring of adjacent lowlands and so promotes luxuriant plant life in the vicinity of many bird cliffs.

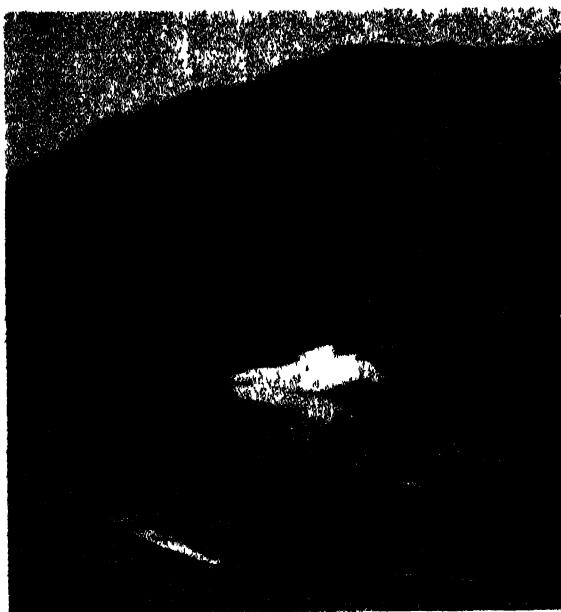
Svalbard never had an Eskimo or other native population, but it has long been the resort of Europeans for various reasons. Soon after its discovery by Barents, in 1596, Dutch



SVALBARD (SPITZBERGEN)

1. Mine entrance at the Longyear City Norwegian Coal Mines. 2. Sverdrup Town, a mining settlement in the Longyear Valley. 3. Red Bay, with H.S.H. Prince of Monaco's *Princess Alice* at anchor. 4. Hunting sloop in Ice-fjord. 5. Coal loading at Advent Point

Photos: Norges Svalbard og Ishaus-undersøkelser; Norwegian Embassy; R. N. Rudmose Brown, W. S. Bruce



PORI BURWELL: HUDSON STRAIT
Eskimo race in kayaks
Photo Canadian Official News Bureau

and English whalers began to haunt Svalbard, using its safe and commodious bays for boiling down the blubber of the Greenland whales captured at sea. There were at times 200 whalers in Svalbard waters and ashore were many temporary summer settlements, now marked by ruins of blubber-houses and the mouldering head-boards of cemeteries. Rival claims to sovereignty led to heated disputes, but died away as the extinction of the whales ended the industry.

Then the eighteenth century brought Russian hunters and trappers, who built log houses so substantial that some survive to-day. Every winter—for summer furs are valueless—several hundred trappers almost colonized Svalbard and some of them stayed year after year. With the decrease of game they gave way, in the nineteenth century, to Norwegian trappers, who worked final havoc with the wild life. A few still winter in remote parts. This hunting spread also to Jan Mayen, eastern Greenland and Fridtjof Nansen Land.

The last and most important economic interest in Svalbard is coal. Coal, though its presence was known centuries ago, was not worked for export until early this century. There is abundance, much of it being of good steam quality and relatively easily mined by adits in the frozen ground. Svalbard, especially Ice Fjord, was, for the first decade or two of this century, the happy hunting ground

of prospectors and land claimants; a No Man's Land in which land was to be had for the taking, but in which the claimant had no redress for trespass. Out of this happy anarchy—for the lack of ordered government worked passably well—grew several important mines, which now have their rights recognized under Norwegian rule. The mining camps are well built wooden "cities" with stores, hospitals, amusement halls and schools, all lit by electricity and each harbouring several hundred miners all the year round.

Export is possible only in summer, when all stores and provisions are imported. The coal goes to Norwegian and White Sea ports. The winter population, all miners, is about 1500 and the coal production in 1950 was slightly over 500,000 tons. This industry, chiefly in Norwegian and Russian hands, was closed down entirely during the war of 1939-45, but has now been re-established, and probably the vast quantities of pure gypsum will soon also be mined. The abundant iron ore is not very accessible and is unworked. A few cruising liners bring the only other visitors. Bear Island has an abandoned mine and, like Svalbard, a meteorological observatory. Another observatory is the only use to which Jan Mayen is now put.

Novaya Zemlya. These two large islands are a northward extension of the folded Ural Mountains. They rise in the central zone to over 3000 feet, with valley glaciers, especially in the north, and are flanked by plains. There is much low lying land, a great deal of which is covered by a sparse tundra vegetation, affording pasturage for reindeer. Norwegian hunters used to visit the islands until, in 1877, Russia tried to colonize them with Samoyedes.



TRAPPER'S HUT ON AXEL ISLAND, SVALBARD
Photo R. N. Radness Brown

This attempt has met with small success, but there are a few inhabitants to-day, and several meteorological observatories are maintained now that the Kara Sea route to Siberia has some importance. Reports of a little poor coal and copper ore offer no prospects of mining.

Fridtjof Nansen Land (Franz Josef Land). This is the least known and most Arctic of all the north polar island groups. All the larger islands have coverings of névé ice and even on the lower ground snow lies long in summer, for the group is almost unaffected by the warmer North Cape branch of the

North Atlantic drift. Like Svalbard these islands have never had a native population, but have long been visited by roving Norwegian seal hunters, when the persistent fringe of pack-ice allowed access. There is a Soviet observatory on Rudolph Island in the far north and another on an island to the far east. The name of the islands was due to their discovery by Austrians in 1892: its recent change to Fridtjof Nansen Land was due to the fact that it was to this land that Nansen and Johansen came in their long journey from the drifting *Fram* in 1895.

Antarctic Exploration

THE early Greek astronomers, in conceiving the world to be a sphere, propounded in general terms the problem of Antarctic exploration. What lay in the vast unknown area of the Southern Hemisphere? Gradually there took shape the idea of a Southern Continent to balance the known lands of the Northern Hemisphere. It was not, however, until the Age of Discoveries when men began to regard the ocean not as a barrier but as a highway that any light was thrown on the problem.

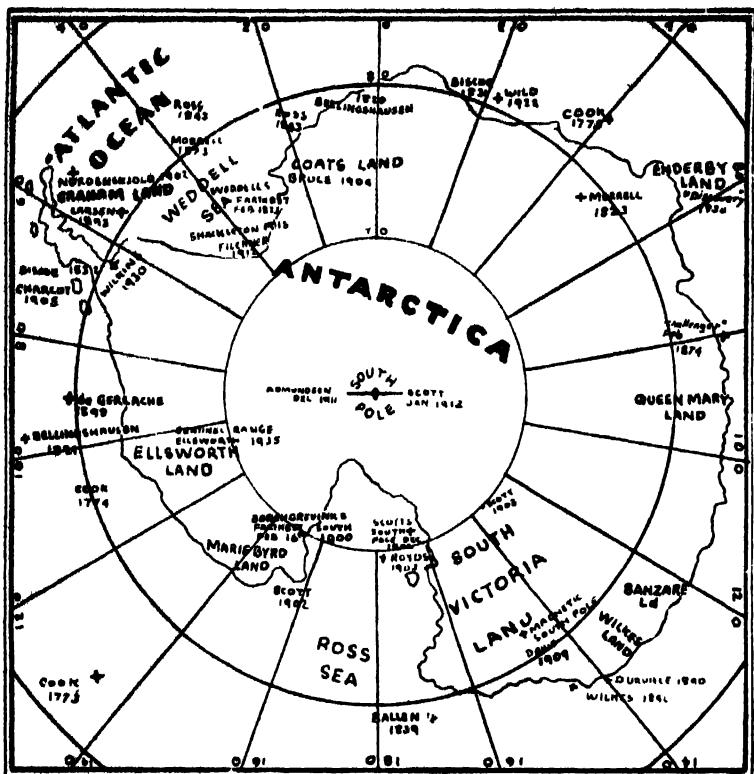
In the sixteenth, seventeenth, and even in the eighteenth, centuries every new landfall in southern latitudes was in turn hailed as the Southern Continent and in turn displaced from that claim. Tierra del Fuego, New Guinea, Australia, New Zealand and many small islands each had its turn. Gradually the possible location of this mysterious land was pushed farther and farther south, but it still held place in voyagers' beliefs.

In 1772 James Cook was sent by the British Government to find the Southern Continent and to open trade relations with its inhabitants. In a circumnavigation of the world in high southern latitudes Cook made four attempts to push south and each time was stopped by heavy ice. He found no land, but proved that if the Southern Continent existed it was probably icebound and uninhabitable. These negative results discouraged for a time any further voyages, for the venture held no prospect of gain.

Early in the nineteenth century sealing vessels from Britain and America were in the habit of visiting South Atlantic islands in search of fur seals. Some of the more venture-

some added a little to the scanty knowledge of Antarctic regions. Islands such as the South Shetlands were found in 1819, the South Orkneys in 1821 and the peninsula of Graham Land in 1820, the latter by E. Bransfield. James Weddell in 1821 reached the record southern latitude of $74^{\circ} 15'$ south in the sea that bears his name. In 1831 J. Biscoe discovered Enderby Land, which has since been found to be part of the Antarctic Continent.

A Period of Discovery. But 150 years ago Antarctic exploration had not begun and the few discoveries were only chance landfalls of voyagers bent on commercial gain. Then came a short but brilliant and effective period. In 1819-21 the Russian F. G. Bellingshausen found Alexander Land and so revived hopes of a Southern Continent, besides exploring Cook's discovery of the South Sandwich group. In 1838 Dumont D'Urville led a French expedition, in 1840 C. Wilkes an American expedition. They both added coastlines to the south of the Indian Ocean. And then in 1841-44 came the British Government's attempt under Sir J. Clark Ross in the *Erebus* and *Terror*, the ships that a few years later disappeared in the north with the Franklin expedition. Ross discovered a great area of land in South Victoria Land, though ice prevented his landing; he found the volcanoes named Erebus and Terror, the great Ice Barrier of the Ross Sea and dimly discerned land to its east. In the Weddell Sea he narrowly missed discovery of land and took a sounding of 4000 fathoms, no bottom, which misled geographers until it was proved to be erroneous sixty years later.



This fruitful expedition marked the close of an era and until the end of the nineteenth century little was accomplished in Antarctic discovery. All polar effort was concentrated in the north, largely owing to the mystery of Franklin's fate. The *Challenger* in 1874 was the first steamship to cross the Antarctic Circle, but, beyond awakening the hopes of men of science, she did little: her work was in other seas. Wandering whalers added a few facts, and, in 1896, Borchgrevinck, at Cape Adare in South Victoria Land, made the first landing on the Antarctic Continent. At length in 1898 the *Belgica* took to the Antarctic the first truly scientific expedition since the days of Ross, and made many investigations on the western side of Graham Land. This was the first Antarctic expedition to spend a winter in the southern ice.

Twentieth Century Expeditions. The opening of the twentieth century saw a concerted attack on the Antarctic by expeditions of many countries. At last the tireless advocacy of Antarctic exploration by such men as Sir J. Murray, Sir C. Markham and Dr. von Neumann took concrete shape. The *Discovery*, 1901-04, under R. F. Scott explored Victoria Land and the Ice Barrier. The German *Gauss* under E. von Drygalski found Wilhelm Land in

1902 and did scientific research with true German thoroughness. W. S. Bruce in the *Scotia* found Coats Land in 1904, an unexpected discovery, and explored the dangerous Weddell Sea. O. Nordenskjöld's Swedish expedition in the *Antarctic* did equally valuable scientific work on the east of Graham Land, and J. Charcot's *Français* and later his *Pourquoi Pas?* worked on the west of that land and carried discovery well to the south.

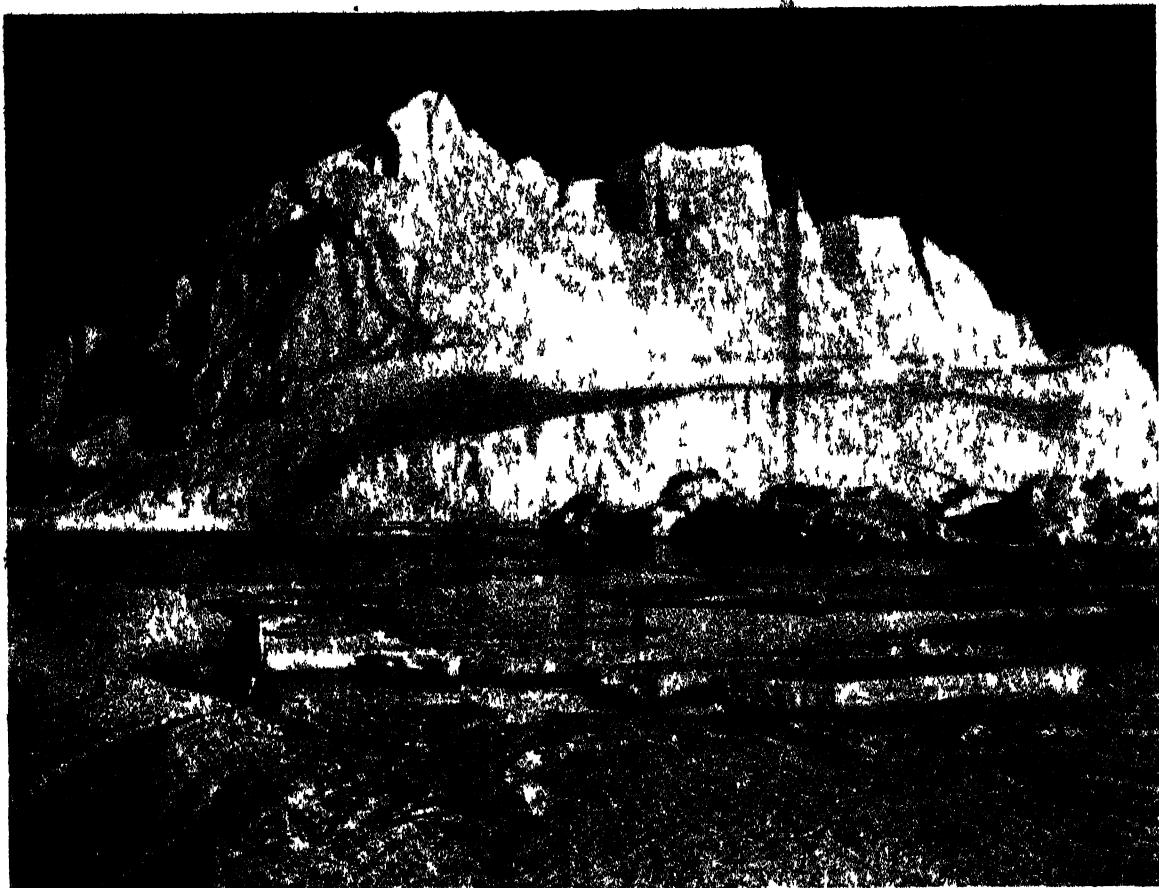
Pursuit of the South Pole. By this time actual discoveries combined with much circumstantial evidence had made the existence of an Antarctic Continent extremely probable, and the hypothetical outline first drawn, in 1886, by Sir J. Murray, showed signs of being nearly an expression of the truth. Knowledge of a few accessible bases made it possible to plan, with

reasonable chance of success, a journey to the Pole. And so for a time this feat of endurance became the ideal of the explorer. In 1909 a party led by Sir Ernest H. Shackleton reached a southern record in latitude $88^{\circ} 23'$ south, and, what was more important, traversed the almost unknown high plateau of Antarctica. In 1910 R. F. Scott returned south in the *Terra Nova* with the hope of reaching the Pole by Shackleton's route. In this he was successful, he and his four companions reaching their goal on 17th January, 1912, to find that a Norwegian party under R. Amundsen had been there a month earlier, on 14th December, 1911. The fate of the party on their return journey is well known. The fortitude of Scott, Wilson, Bowers and Evans and the tragic self-sacrifice of Oates enrich the story of polar exploration.

The attainment of the Pole allowed explorers to direct their endeavours to more important aspects of exploration. D. Mawson in the *Aurora* in 1911-14 added much to the coastline of Antarctica and W. Filchner in 1912 in the *Deutschland* extended our knowledge of the coasts of Coats Land and narrowly escaped losing his ship in the Weddell Sea. Shackleton followed him and added to the knowledge of Coats Land in 1915, but lost his ship, the *Endurance*, by ice pressure. Eventually he and

SCENERY IN POLAR SEAS
Top: Glacier Bell Sound, Svalbard (Arctic Ocean). Centre: Prince Charles Foreland, Svalbard. Bottom: Tabular iceberg in the Waddell Sea (Antarctic).
Photos: W. S. Bruce; Lady Stanhope





AN ICEBERG IN THE WEDDELL SEA, WITH AN EMPEROR PENGUIN ON SEA-ICE
Photo F. Hurley, copyright by Lady Shackleton

his men all reached safety largely through the daring and superb seamanship of Shackleton. Once again Shackleton returned south in 1921 in the *Quest*, but died suddenly at South Georgia.

And now a new means of transport was inevitably to invade the field of exploration. In December, 1928, flying was first tried in the Antarctic, when H. Wilkins flew over Graham Land to latitude $71^{\circ} 20'$ south and back again to his base in Deception Island. He made many discoveries, but some of his changes in the map have not stood the test of later detailed ground work. A combination of flying and ground work was the characteristic feature of R. E. Byrd's American expedition of 1929, for which he made his base on the Ice Barrier near Amundsen's former quarters. This expedition made important discoveries in King Edward Land and beyond in Marie Byrd Land and in the great Queen Maud Ranges. Byrd also made a flight to the Pole and back, a total distance of some 1600 miles, in nineteen hours.

In 1934 Byrd returned to his base in the Ross Sea and by sledge and aeroplane extended his discoveries and disproved the existence of a strait at the south-eastern end of the Ross Sea, the existence of which he had previously suggested.

A spectacular and daring flight was that of L. Ellsworth in 1933 of 2300 miles across Antarctica from Dundee Island off Graham Land to the Bay of Whales in the Ross Sea. Four landings were made on the way and the journey took twenty-two days instead of the contemplated fourteen hours.

Later Expeditions. The development of the whaling industry in the Southern Ocean during the twentieth century has led to many Antarctic discoveries, principally of the "missing" coastlines of Antarctica between Coats Land and Victoria Land. Norwegian whalers, seeking new fields for the industry and the possibility of useful harbours, but animated at times by the spirit of exploration, have found, in recent years, many stretches of coastline

between Enderby Land and Coats Land, while Sir D. Mawson, on behalf of the Australian Government, did comparable work in 1929-31 to the east of Enderby Land and in that vague territory formerly known as Wilkes Land.

The detailed scientific work of *Discovery*, *Discovery II* and *William Scoresby* in sub-antarctic regions merits the highest praise. It was the outcome of a scheme of the Falkland Islands Government to elucidate problems referring to whale breeding and migration.

An Antarctic expedition under the leadership of J. Rymill returned to this country in 1937 with valuable information, having for three years explored the South West of Graham Land. Another expedition under Rear Admiral Byrd returned to the U.S.A. in 1947 after a short visit. It comprised a large and exceptionally well-equipped force of observers and scientists.

There is still a great deal of pioneer exploration to be done in the Antarctic. The edge of the continent south of the Pacific is for the most part untraced and on the west of the Weddell Sea there is a long gap. Both of these areas are difficult if not impossible to reach by ship on account of congestion and pressure of pack-ice. Although the interior of the continent is mainly covered by a sheet of ice, certain

ranges and isolated peaks stand above it and give clues to its underlying structure. All these need to be examined carefully. And many of the charted coastlines have had no detailed exploration. Beyond these major tasks there are problems relating to the climate and weather, which are inadequately understood, to the ice and ice action, and to the configuration of the ocean and the physical conditions of its water. For several generations the Antarctic explorer will have ample scope.

The Antarctic Regions. It is now established beyond any reasonable doubt that a vast Antarctic Continent with an area of over four million square miles lies unsymmetrically about the South Pole. Around most of its circumference the continent extends northward to about latitude 70° south or to the Antarctic Circle, but south of the Atlantic lies the great bight known as the Weddell Sea and south of the Pacific is the Ross Sea, while south of South America, Graham Land, also known as West Antarctica, is a long curved peninsula reaching to about latitude 61° south. Almost the whole continent is covered by an immense ice-sheet, the surface of which in the interior lies at an altitude of 9000 to 10,000 feet and may be regarded as a wasting relic of the



ANTARCTIC PACK-ICE, BAY OF WHALES, ROSS SEA

Photo: Wide World

Pleistocene Ice Age. The thickness of the ice sheet is unknown, but is probably at least 2000 feet in the interior.

In a few places great ranges stand above the level of the ice. Thus the great horst or up-heaved fault ranges of Victoria Land, known variously as the Prince Albert Mountains, Royal Society's Range and Queen Maud Mountains, rise to heights of 13,000 to 15,000 feet and are crossed by outflow glaciers of the ice-sheet passing through transverse faulted valleys. These include the huge Beardmore Glacier up which Shackleton and later Scott travelled. Around Enderby Land many peaks project through the edge of the ice-sheet but have not yet been reached. In Graham Land, Marie Byrd Land and Edward Land projecting peaks, snow free in part during summer, reveal a folded structure similar to that of the Andes and in striking contrast to the ancient plateau structure of the rest of Antarctica.

The Slowly-moving Ice-Sheet. The ice-sheet, slowly moving outwards by its own weight of ice accessions, in many parts overrides the coastline and stands out to sea in great glacier tongues ending in lofty ice cliffs which may be many hundreds of miles in width. Occasionally they calve off by flotation and make the monster table-topped bergs of the Antarctic. These may be several miles in length and have been measured up to 100 miles. They are distinct from the small and generally unsymmetrical bergs which are shed by the Arctic glaciers, especially those of Greenland.

In the southern end of the Ross Sea the apparently permanent Ice Barrier discovered by Ross would seem to be afloat over most of its area, which is equal to that of the British Isles, and to be formed of coalesced tongues of glaciers from the plateau, covered over and depressed by deep layers of permanent snow. Its seaward edge is 400 miles in length and from time to time breaks off in gigantic bergs. At the south of the Weddell Sea there seems to be a comparable barrier which is little known. Since the ice-sheet envelops most of the rock surface moraines rarely form, and the extension of most glaciers to the sea results in their terminal moraines being hidden beneath the water.

Antarctic glaciation is clearly receding and there is evidence of the ice-sheet having been several hundreds of feet thicker and of wider extent.

Ice-free areas of small extent occur on lofty mountain slopes and even along some coasts,

either through the sweeping action of winds or the short periods of warm sunshine at mid-summer.

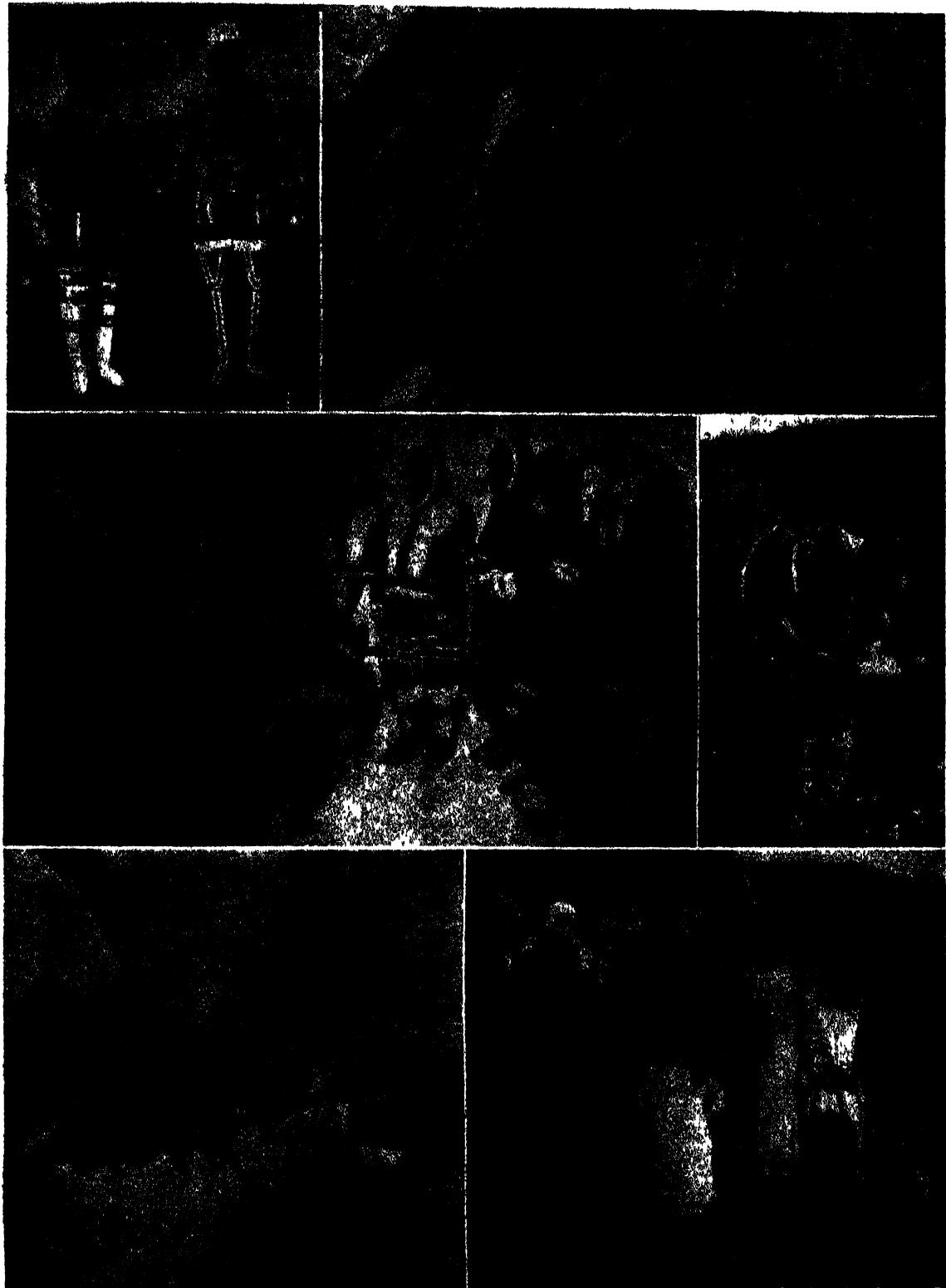
The existence of this cover of moving, though slowly moving, glacier ice precludes all possibility of mining, even if valuable minerals were known to exist. It should not be overlooked that shipping in the belts of pack-ice surrounding Antarctica would be virtually impossible.

Seas of the Antarctic. Around Antarctica lie the waters of the so-called Southern or Antarctic Ocean which in one sense are merely the southerly extensions of the three great oceans, but differ from them in respect of the habitual presence of pack-ice. This ice is generally present south of latitude 60° south but its border oscillates from season to season and year to year. There is no month in which the sea-water may not freeze, but summer formation is not extensive. The pack-ice drifts with wind and current and melts only if it is swept into warmer seas of lower latitudes. It is this ice that is the chief difficulty with which exploratory ships have to contend, and is particularly dangerous in the circulatory currents of the Weddell and Ross Seas. The Weddell Sea has trapped most ships that have entered it and some at least it has crushed.

Now that the ocean-going sailing ship has disappeared the Southern Ocean is rarely traversed by commercial vessels. Great Circle routes between South Africa and Australia and between Australia and Cape Horn dip into the regions of pack-ice where the safety of the ships using them is gravely endangered but nowadays these routes are not followed and the Cape Horn waters seldom see a ship.

Huge icebergs, however, may drift well northward into the course of shipping, for their enormous bulk gives them resistance to higher air and water temperatures. Perhaps it is fortunate that north-west winds in the 'fifties tend to prevail and help to push the bergs southward.

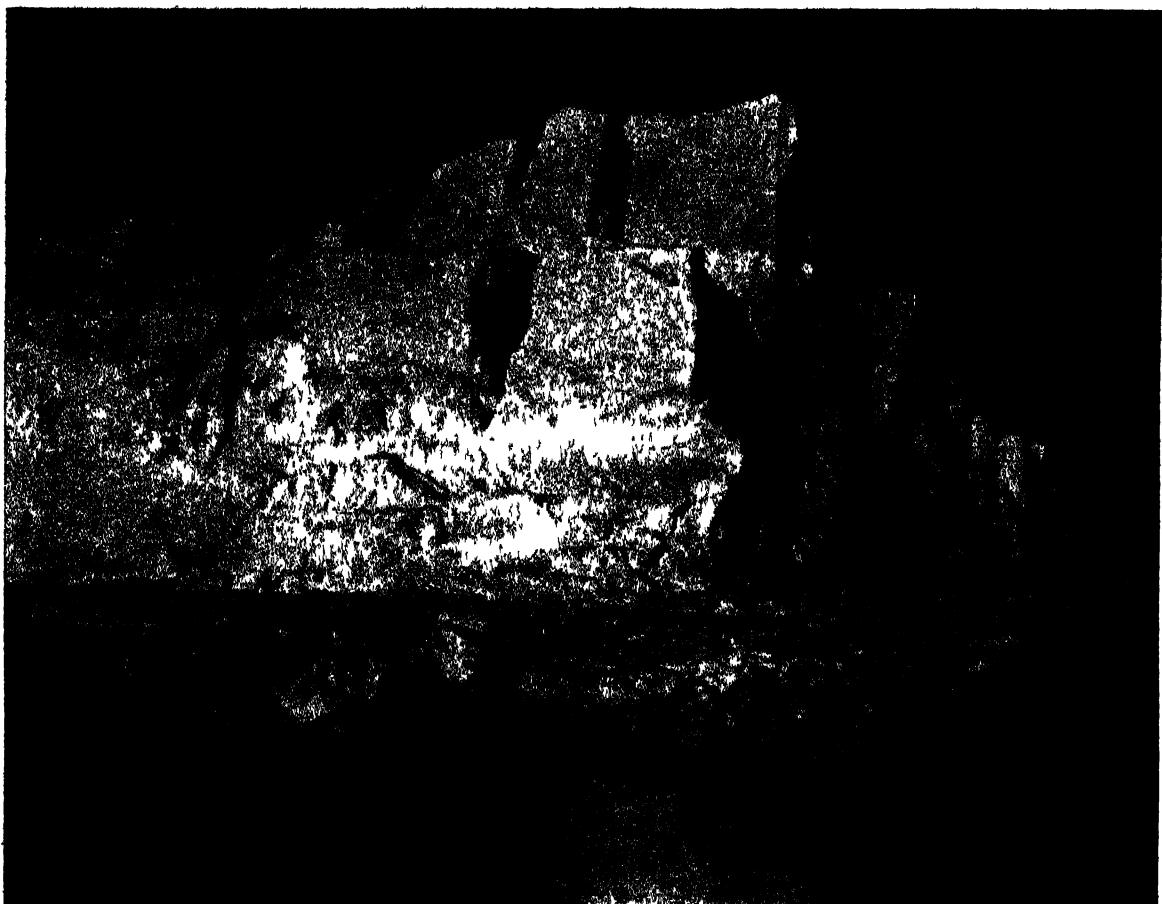
In the Southern Ocean on the edge of the Antarctic lie several lonely uninhabited islands and groups of islands. Some, like the South Orkneys, the South Shetlands and the Palmer Archipelago, are heavily glaciated and are practically Antarctic in character. The grim festoon of the South Sandwich group includes several active volcanoes. Volcanic Kerguelen, a dreary wind-swept waste of bog, moor and valley glaciers has, like South Georgia, many fine harbours which have been the site of whaling stations.



PEOPLES OF ARCTIC LANDS

1. Eskimo girls at Godhaven, west Greenland. 2. Old Eskimo women and their tent, Arctic Canada. 3. Copper Eskimos, Coronation Gulf, Arctic Canada. 4. Eskimo girl carrying child, Arctic Canada. 5. Eskimo family in snow igloo, Arctic Canada. 6. Eskimo types in Arctic Canada

Photos: Canadian Official News Bureau; Wide World



PACK-ICE AND A HUGE ICEBERG OFF GRAHAM LAND

Note men at foot of the berg

Photo F. Hurley; copyright Lady Shackleton

Climate. The vast ice-sheet of Antarctica acts as a reservoir of cold and it is not to be wondered at that no month even at sea-level has a mean temperature above freezing point. Thus in a sense summer in the Antarctic is little more than an astronomical conception, marked by continuous daylight and a low Sun but never a period of decided warmth. There are, however, calm days when in the Sun there is a bodily sensation of warmth even though the shade temperatures show several degrees of frost. Exposed areas may thus be cleared of their thin winter covering of snow, but on the high surface of the glaciers there is little melting and ice may form in the sea any month.

Winter is the predominant season and winter temperatures are low, though at sea-level little lower than in the Arctic. The plateau temperatures are much lower, but have not been recorded in winter. Even in midsummer the highest temperature recorded at the South Pole was only -2.2° Fahrenheit.

The severity of this winter cold is accentuated by the frequent strong southerly winds blowing off the ice-sheet. These winds are characteristic of the Antarctic and may well be the expression of a permanent anticyclonic area over the ice from which air currents are moving outwards down the slope of the ice towards the Southern Ocean. Southerly blizzards show wind velocities of 80, 90 or even 116 miles per hour. Naturally these winds severely tax the strength of Antarctic sledge travellers. Between their successive occurrences there are, however, periods of calm when the Antarctic climate, in spite of its cold, is enjoyable. Rain practically never falls, and snow, in the form of fine ice spicules, is not heavy, though the strong winds raising clouds of driven snow give the impression of frequent falls.

Beyond the high pressure area of the Antarctic Continent the barometric gradient falls steeply to the low pressure belt of the 'fifties and 'forties, with their procession of deep



ALPINE FLOWERS

1. Iris reticulata 2. Primula pulcherrima 3. Aquilegia alpina 4. Cypripedium calceolus 5. Autumnal Crocus (*C. autumnale flore-pleno*)
9. Bartsia's St. John's Wort (*Hypericum Bartsii*) 10. Star-like Anemone or Wind-flower (*Anemone stellata*)

cyclones and their tempestuous seas. The subantarctic islands experience this climate in measure as their position is close to or far from the Antarctic Continent.

Vegetation and Animal Life. The low summer temperature, the thinness of the soil and its permanently frozen state, and the long snow cover, militate against plant growth. Probably also the omnivorous penguin, present on nearly all possible sites, helps to destroy any vegetation that might start to grow. Only two flowering plants (*Deschampsia* and *Colobanthus*) are found in rare stunted specimens in Graham Land and the South Orkneys, which have a modified Antarctic climate. For the rest mosses and lichens are found in small colonies, the former especially where bird guano supplies nutriment. An orange coloured lichen (*Placodium*) occasionally supplies a splash of bright colour. Micro-organisms in the soil are few and slow in action, so that decomposition of organic remains is very tardy. In the seas, however, there is a wealth of plant life, chiefly unicellular diatoms, and red algae occasionally colour small patches of snow. The cause and effect of this abundance of diatom life are discussed in the chapter on Arctic Regions (Plant and Animal Life of the Seas), where the same phenomenon occurs (see page 113).

The land of Antarctica offers no permanent home for animal life—there are no bears, foxes or reindeer. On the other hand the sea is prolific in life. Four kinds of seal are truly Antarctic and two others are subantarctic.

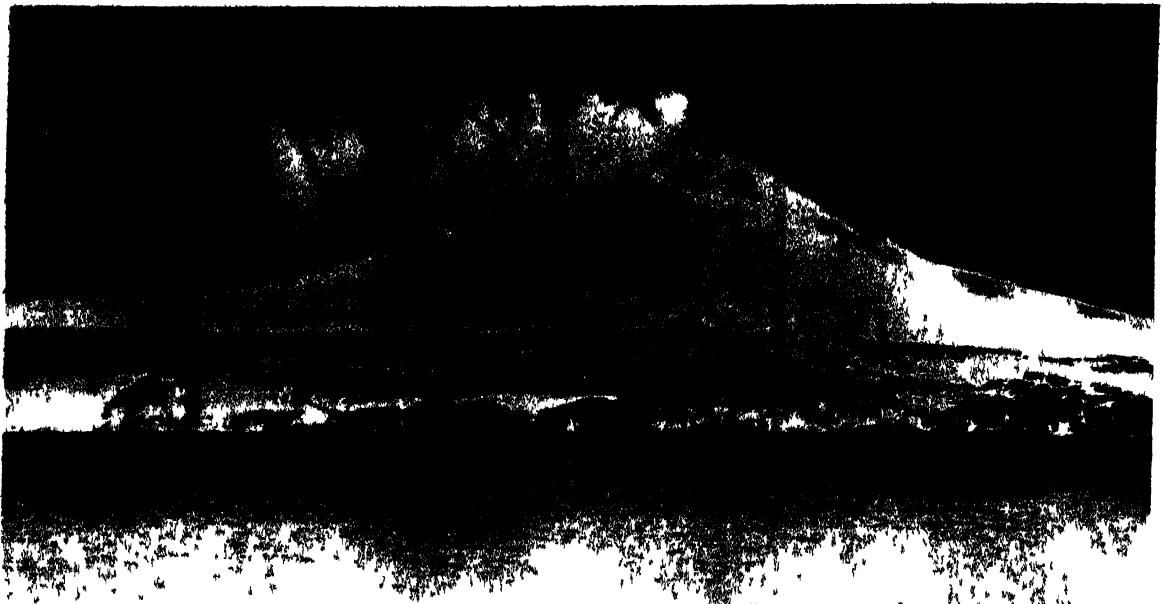
The four Antarctic ones are the common Weddell seal, up to nine feet in length, which pups ashore in spring, the smaller and much rarer crabeater, the strange solitary Ross seal which keeps to floating ice and is unknown in its young stages, and the huge fourteen-foot sea-leopard which voraciously chases penguins in the sea and even threatens man. The subantarctic seal-elephant is hunted for oil and skin, and the fur seal was nearly exterminated a century ago: the other seals fortunately have no commercial value and are left unmolested.

Many large whales including the hundred-foot blue whale, the slightly shorter fin whale and the small humpback haunt the confines of the Antarctic seas in summer and occasionally pass beyond the pack into the Ross Sea, but the only truly Antarctic whale is the alert killer whale or grampus, a true beast of prey which attacks whales and would not hesitate to attack man if he were accessible.

Bird-life. Although the Antarctic has no land birds it has many summer visitors among sea birds and one permanent resident. The Emperor penguin, a bird standing three feet in height and weighing eighty pounds, lives all the year round among the ice of the far south and, unlike other penguins, does not migrate north to the edge of the pack-ice in autumn, and, strangest of all, lays its eggs in midwinter. A high mortality among the chicks accounts for the rarity of this bird. Three smaller penguins are numerous and plebeian. None shows the dignity, restraint or aloofness of the Emperor.



EAST GREENLAND: NORDENSKJÖLD GLACIER
Photo: J. M. Wordie



SAUNDERS ISLAND AN ACTIVE VOLCANO IN THE SOUTH SANDWICH GROUP
Photo Central

Their numbers are also incredible when they line ice-free coasts in spring for nesting. Mile upon mile may be black with their myriads and the grave silent landscape then wakens into vociferous life. The subantarctic islands harbour other species. Lack of enemies on land and abundant food in the sea account for their prodigious numbers. In addition to penguins other birds, including the giant petrel, the carrion feeder of the Antarctic, the Cape "pigeon," the graceful snowy petrel and the Wilson's petrel or Mother Carey's chicken all nest on the confines of the Antarctic. Other nesting migrants are the black-backed gull, the blue-eyed cormorant, the sheathbill, the rapacious skua-gull and the Arctic tern.

Antarctica has never supported any human life except temporary parties of explorers. They find it possible to obtain much of their food locally in seals and penguins. On the surface of the plateau there is absolutely no nutriment. It must not, however, be supposed that the Antarctic is unhealthy to man if he is adequately fed and clothed. The reverse is true. The air is almost sterile: harmful bacteria are absent. The explorer is safe from the ills of civilized life: even colds seldom if ever occur. Scurvy, the old-time scourge of the polar explorer, is now known to be a deficiency disease due to lack of the vitamins of fresh food: by a diet of seal and penguin meat it can easily be avoided. And it should be noted that the

polar records show a smaller percentage of accidental deaths among most expeditions than is recorded in the population of an English town.

Commercial Activity. The only commercial activities that ever have touched the Antarctic are sealing and whaling. The former flourished only for a short period early in the nineteenth century and ended with the virtual extinction of the fur seal. Whaling has had more persistence. A hundred years ago a few attempts met with little success and it was not until scientific expeditions began to report abundant whales that the industry started in earnest about 1905. Steamships and harpoon guns had replaced sailing ships and hand harpoons, thus enabling the whaler to catch the quick-moving "fin whale" that of old enjoyed immunity on account of its speed. The industry has steadily grown until whalers and factory ships frequent most Antarctic waters during the southern summer. Land stations are being given up in order to save taxation expenses. About 20,000 whales are taken annually in Antarctic seas and the profits are great. Not only the oil, used for lubrication and margarine, is valued, but the carcase is made into whale guano. As, however, an unlimited number of whaling expeditions would be unprofitable, an international agreement now exists to limit the number of whales that may be caught and the number of factory ships that may operate.

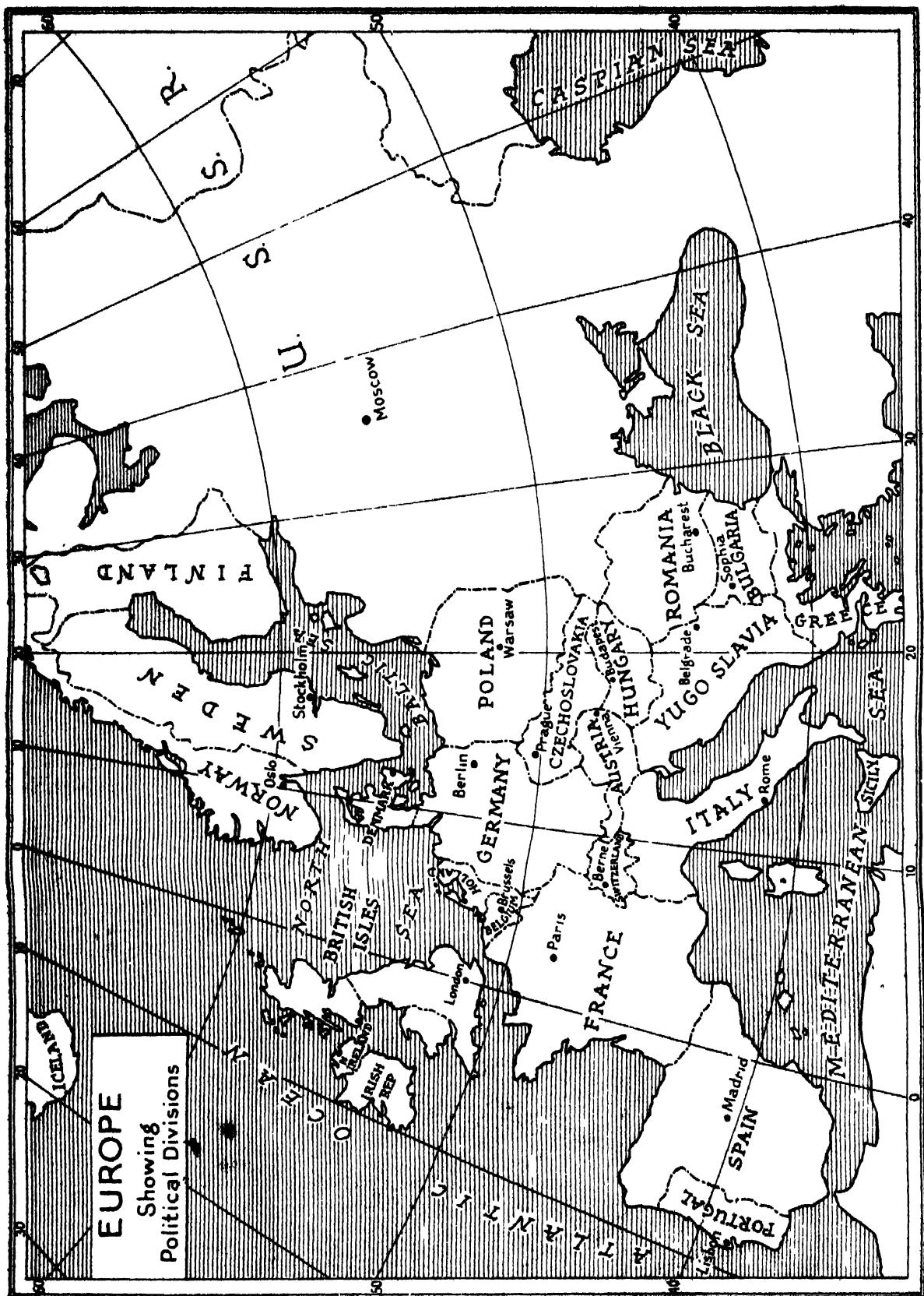
This industry, though it has never utilized the shores of the continent, has resulted in territorial claims over most of Antarctica: few of them have any reality. Claims are in the form of sectors and thus arrogantly extend over unknown territories to the South Pole. The Falkland Islands dependencies, claimed in 1908, extend between longitude 20° west and 80° west and north to 50° south, except for an area between longitude 50° and 80° west and latitude 50° and 58° south, the claim to which, at first made in error, was hastily abrogated on the protest of Chile and the Argentine. This sector includes the South Orkneys and South Georgia. The Ross Dependency of New Zealand, dating from 1923, includes the Ross Sea and its shores, and the Australian sector

of 1933 lies between longitude 45° and 160° east, south of latitude 60° south, with the exception of the Adelie Land coast which was claimed by France in 1924. The isolated and virtually inaccessible islands of Peter I and Bouvet are claimed by Norway. The United States would appear to make some claim to Marie Byrd and adjacent lands. Renewed interest in the Antarctic has been shown in the years following upon the Second World War. British, Norwegian, Swedish, French, and Australian exploration parties have all been active, whilst efforts have been made by the British to establish more or less permanent research and meteorological stations in the Falkland Islands dependencies.



ELEPHANT ISLAND, WEST ANTARCTICA

Photo copyright by Lady Shackleton



CHAPTER ONE

THE CONTINENT OF EUROPE

ANY large section of the surface of the Earth, such as the continent of Europe, has naturally at least a double interest; and both are suggested in the title of this work.

Such a unit has a direct and purely geographical interest for the traveller, who may be specially concerned with physical features and climatic phenomena as related to scenery and recreation and health; and it has a more or less direct, but only in part geographical, interest for the economist, who must be mainly concerned with the actual or potential wealth of the continent, but may be specially concerned also with the mineral basis of such wealth, which is a problem of geology rather than geography.

The two observers have, however, much in common; and neither can really understand the details in which he or she is interested, without having a clear general idea of the whole as the background against which the details stand out. But—in this Machine Age—the study of Geography has become so mechanical, with so much specialization and so much over-emphasis on statistical details, that it is rare now to find a geographical student with much power of visualizing a continent as a whole or with much interest in its influence as a whole on its inhabitants. How often nowadays is a single complete lesson or lecture devoted entirely to either the shape or the size of Europe?

Importance of Shape and Size. But, in the case of Europe, probably two of the three most important items in the geographical story of its essential meaning and its historic destiny have been, precisely, its shape and its size; and the third item, the relief, owes its importance very largely and directly to the other two, though genetically it underlies both of them.

Even if we include the whole vast "Russian" area, north of 50° north and east of 25° east, a quarter of the continent is peninsular in the strict and narrow sense of the word; and, if we exclude that area, then two-thirds can be called literally peninsular. Indeed, peninsularity is the one characteristic which differen-

tiates Europe from all the other continents. It is itself a single large peninsula of Asia, comparable with India or Arabia, and it is made up of a number of small peninsulas. The whole has one mile of coast to every 200 square miles of area; Norway has one mile of coast to every ten square miles of area.

But what is the exact meaning which we put into, or extract from, the word *peninsularity*? Quite literally, of course, we understand that it describes an environment which is "almost insular", in other words, its essential conditions are like those of an island, e.g. conditions of climate, access to the sea, obvious unity, a certain isolation or detachment, a relatively small area, etc. The last point is important. There are large islands, such as New Guinea and Borneo and Madagascar; but, even when we call them islands, we scarcely think of them as islands. For instance, we do not expect to find them densely peopled or scenes of advanced civilization or with a population inclined or compelled to expand overseas by emigration or conquest or both.

In the case of peninsulas, then, we may expect to find "insular" tendencies, even if the results are slighter and less spectacular, and though we must not expect the inhabitants to be so much individualized, so quick to recognize their limitations—within indisputable and unchangeable frontiers of "estranging seas," so easily blended into an elastic and yet stable unity. For the ideal peninsula is a semi-submerged highland, with an elevated spine—generally running, in all parts of the world, north-and-south; and this "divide" disconnects the western from the eastern flanks, and even gives them different climates, as in Scandinavia and Iberia and Italy. These differences lead to valuable divergences of occupation and production, and tend to concentrate population along the coastlands; but it becomes difficult for the marginal populations to know and to communicate with each other, and so the conditions are not favourable to marked political unity. The histories of Scandinavia and Iberia give admirable illustrations of this.

In making any survey of Europe, then, whatever object we have in view, we should keep always in mind the basal fact of its peninsularity, as ensuring some degree of particularity, variety, freedom, power of initiative, and even imagination. Such an area is not likely to give permanent success to any plans of regimentation, dragooning, mass uniformity, or any other typical obsession of a Machine Age.

Incidentally, we should note that the "subsequent" problem of shape cannot be dissociated from the "antecedent" problem of structure. To some extent, too, though less directly and in "response" rather than in "control," the problem of size cannot be dissociated from that of structure, even if—as in this case—the prominent factor seems to be *lack of size*. For Europe is small even in comparison with South America, not to mention Africa, still less Asia; and in this fact we have one key to its outstanding destiny in the world. It is small enough to be a natural political unit, and to have become more or less such a unit in very early days; for no serious obstacles prevented its various peoples from getting to know one another, and from having constant intercommunications. The one danger was that the core of the area might use its position, as it did on occasion—even, perhaps, from honest and honourable fears about its own safety—to thwart natural and peaceful relations amongst its neighbours and to foster unnatural and unpeaceful relations amongst them. Bismarck is said to have boasted that he had set England against both Russia and France, France against both England and Italy, Italy against both France and Austria, Austria against both Italy and Russia, and that therefore *Germany was safe*.

Structure and Relief. But, in spite of its small size, this comprehensible unit has a wonderful variety of structure and relief, at least over all that half of it which may be called specifically European; and this variety has been of great importance from several points of view, including those of scenery and mineral wealth. There are fully thirty peaks, volcanic or otherwise, elsewhere in the world that are higher than Mont Blanc; but a dozen of them, including all the highest, are in the huge continent of Asia, where they are comparatively "lost." Even inside Asia, Ararat and Lebanon are really more impressive and spectacular than Everest and Kinchinjunga; and the concentration in such a small area makes the inferior

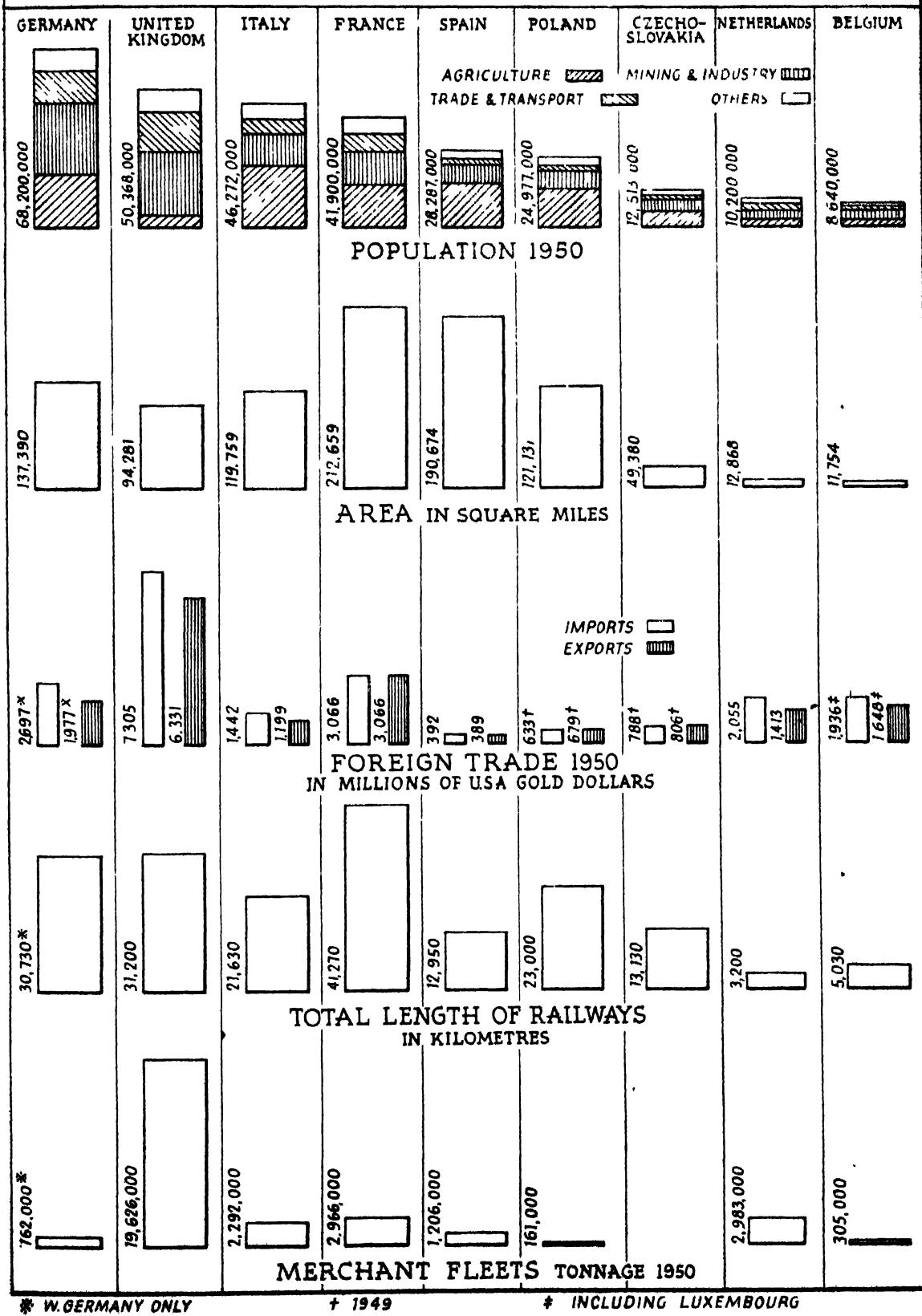
relief of Europe exceptionally effective as a spectacle and as an influence on its inhabitants. The Alps are better known, and can be reached more easily, by the whole of Europe than the Hindu Kush can be by any dense population of Asia.

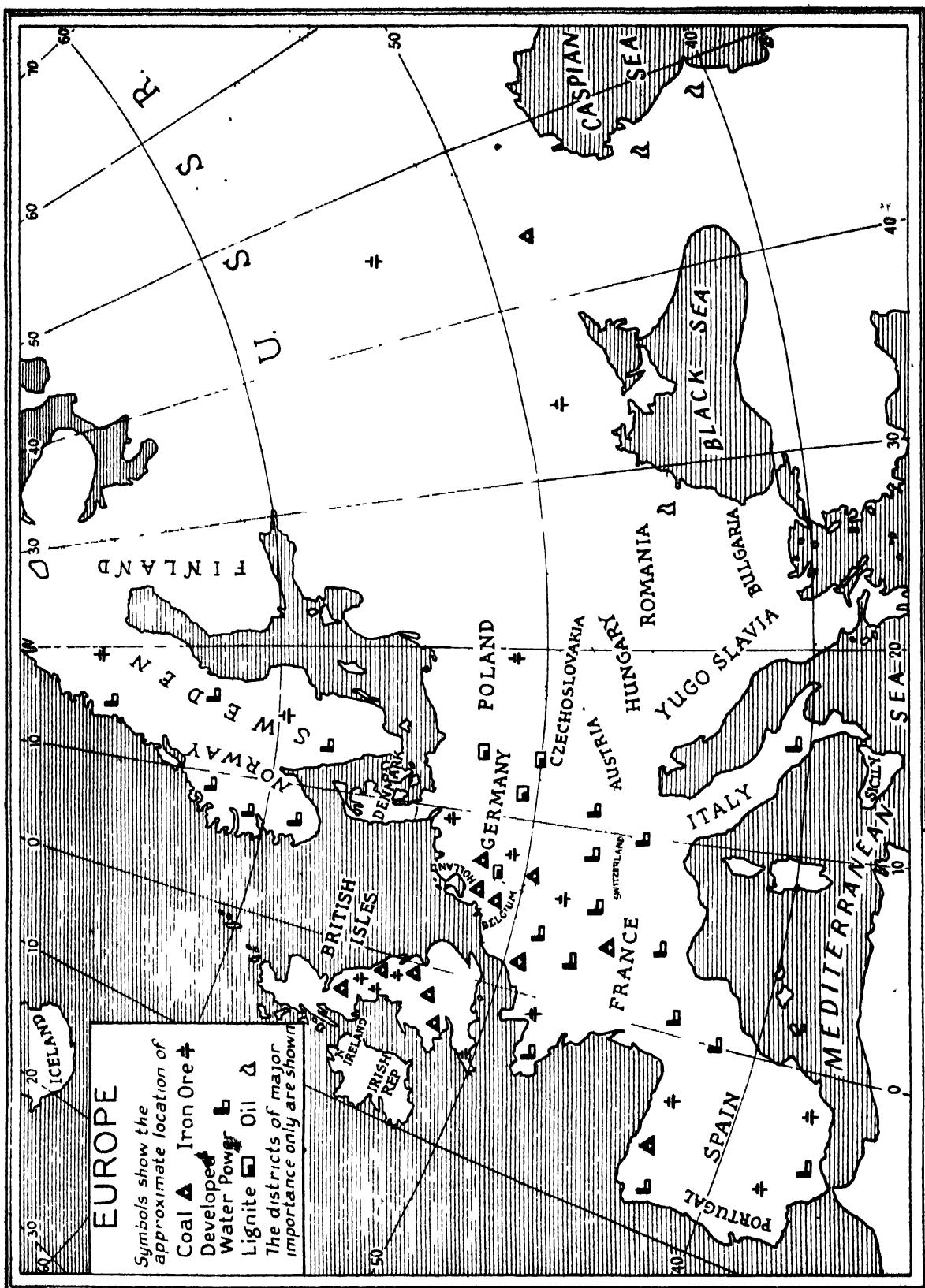
And the marked variety is of forms as well as altitudes. Almost every known land-form is found in Europe, from young folded mountains to platforms of primitive archaean rock; and their nearness to each other makes it easy to attach comparative values to them, and the most important result of this is probably psychological. For it is now fully realized that variety of environment is of supreme importance in stimulating human development. Monotony mummifies.

But this variety of structure and relief, though crowded into such a small area, does not make the unit incoherent internally. Even the young folded mountains, though they influence greatly and directly the main lines of movement, present no very terrible, still less an insuperable, barrier to cross-communication. For they are relatively narrow—narrow enough to be tunnelled, and their highest ranges have the "peak and pass" sky-line known as "Alpine" over all the world. Certainly, the gaps are relatively few, which gives special importance to those few; but they are natural gaps, and the narrowness of the ranges makes the tunnelling reasonably easy. The more or less uniform direction of the ranges east-and-west, too, largely confines the difficulties to the immediate hinterland of the Mediterranean basin; and even where a relief map does not suggest an obvious route, the difficulties are not as great as they seem at first sight. For instance, the saddle between the head of the Adriatic near Trieste and the basin of the Middle Danube is not very difficult, even if it does involve some steep gradients; nor is there any serious difficulty in the course of, or in the inter-relations of, the long and tortuous valleys of the Morava and the Vardar.

Then, beyond the young folded systems, between the barren old blocks of the north and the high Alpine ranges to the south, not only does the relief show a long belt of low and level plain, but also the structure shows covers of limestone and sandstone underlain by valuable coal deposits. There are also rich salt basins; and so the most useful minerals are present just where transport by land and water and access to and from the ocean are exceptionally easy.

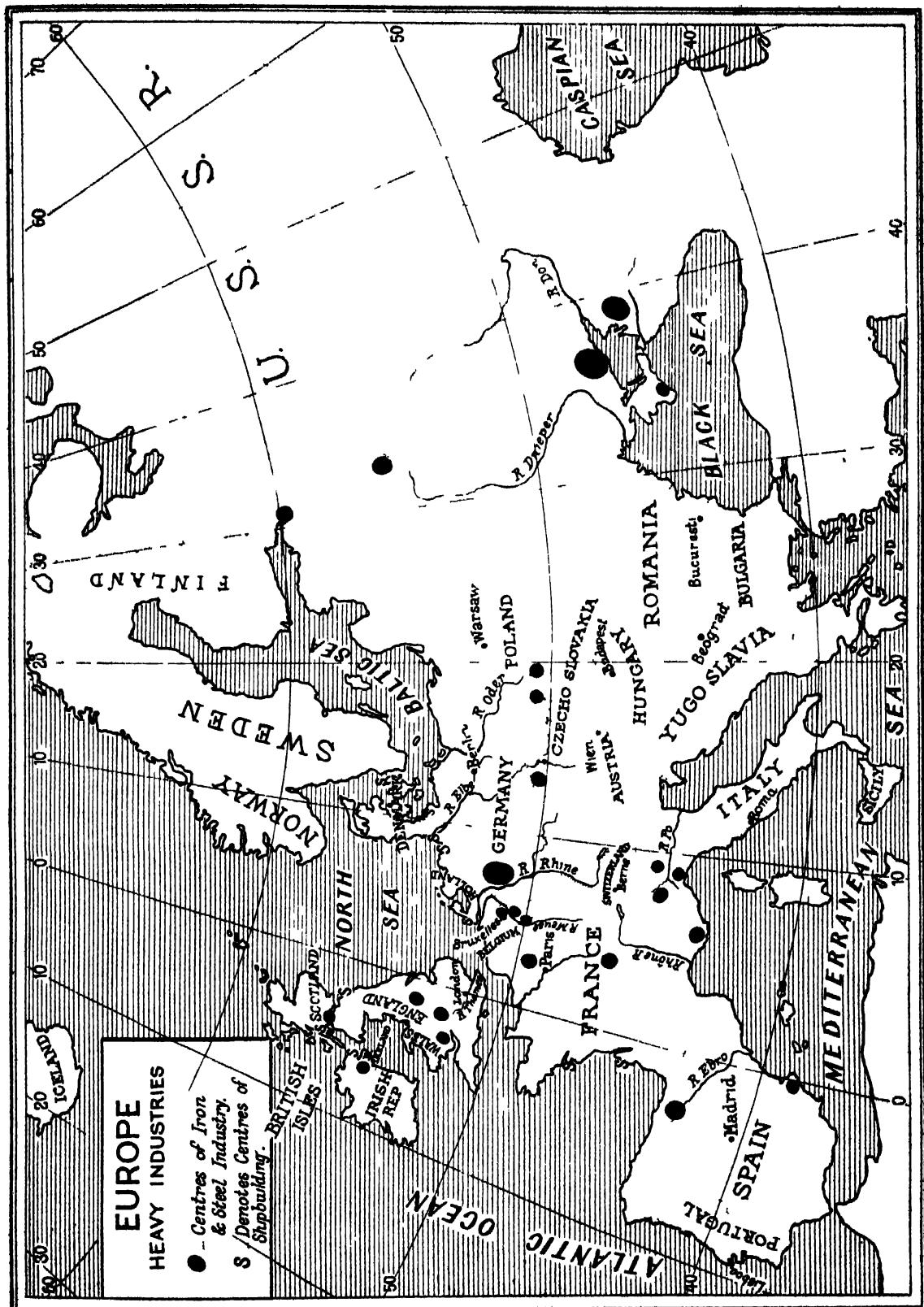
EUROPE

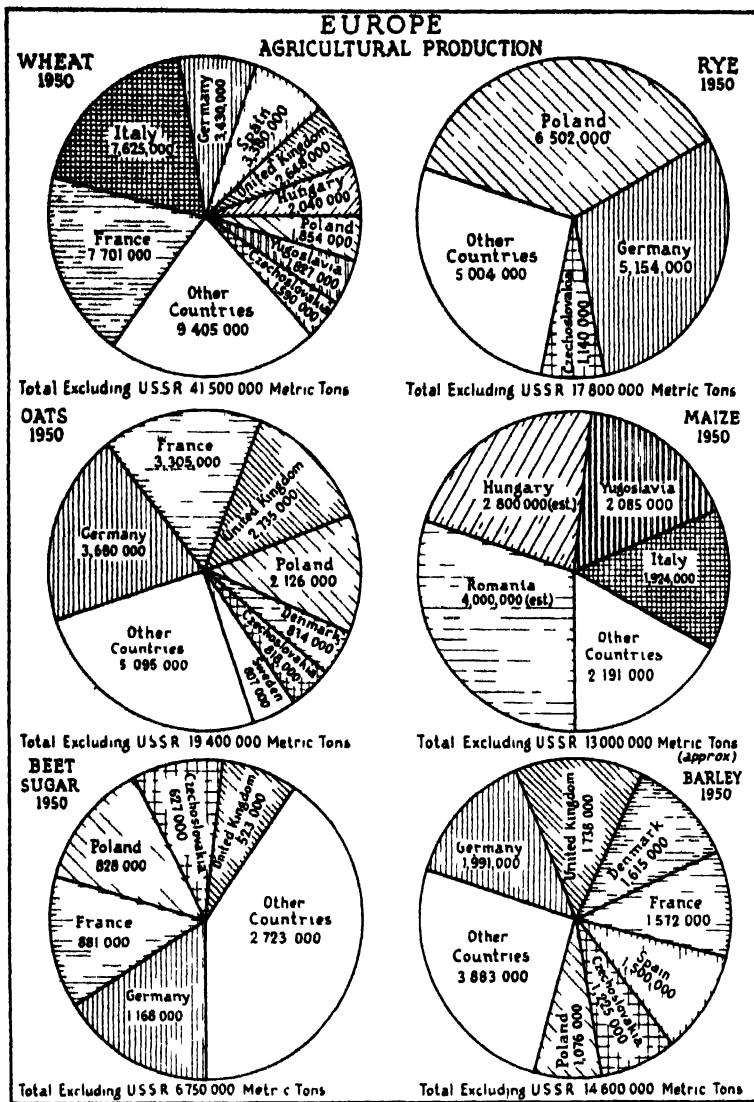




THE CONTINENT OF EUROPE

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Nor is this easy access ever seriously interrupted along three-quarters of the total coastline, and the reason for this is that the climate is really temperate. The conditions are partly, but only to a slight extent and degree, a matter of latitude, for there is no true parallel with them in similar latitudes anywhere else in the world; they are due mainly to the domination of the whole region by the Atlantic Ocean and its currents of air and water. This domination means exceptional conditions of temperature and pressure and humidity; and the result is this truly temperate climate, meaning by that a climate which is seldom too dry or too wet, too cold or too hot—i.e. too cold or too hot for man to be at his best in it, and to be able to plan with a view to immediate action.

Importance of Variety of Climate. The

most important characteristic of this climate is probably its variety—variety of pressure, of temperature, of rainfall; for this is of immense value to the health of the human body and to the activity of the human mind. The variety increases, too, with nearness to the Atlantic; and it may reasonably be related to the historic achievements of the "Atlantic" peoples of the continent.

At the same time there is sufficient unity of the phenomena and of their reactions to justify our calling the climate of the whole unit definitely temperate, even if there are very considerable extremes of temperature and pressure and some deficiency of rainfall in eastern Europe and special distributions of temperature and rainfall in southern Europe; and this brings us back again to our basal fact that Europe is a natural unit, greatly strengthened and enriched by a remarkable variety, which enables different parts and different peoples to make different contributions to the common good. So long as the common sense and the self-respect of these peoples make them fight to the death against any imposition of uniformity, regional or continental,

religious or political, such variety—even with certain natural antagonisms—is only an asset, a very great asset.

These aspects of unity, a definitely "peninsular" unity, constitute one of the best claims of Europe to be regarded as a separate continent and not merely as a peninsula of Asia. There is no such unity in India or in Arabia.

A remarkable and convincing illustration of this may be seen in a comparison of large "sinks" in Europe, whether land basins or inland seas, with similar "sinks" in Asia. In the latter the centres of such depressions tend to be or to become deserts—already dry or rapidly being converted into a dwindling series of salt lakes; and so they are nearly always uninhabited and often even uninhabitable. That is to say, the core of the depression is a

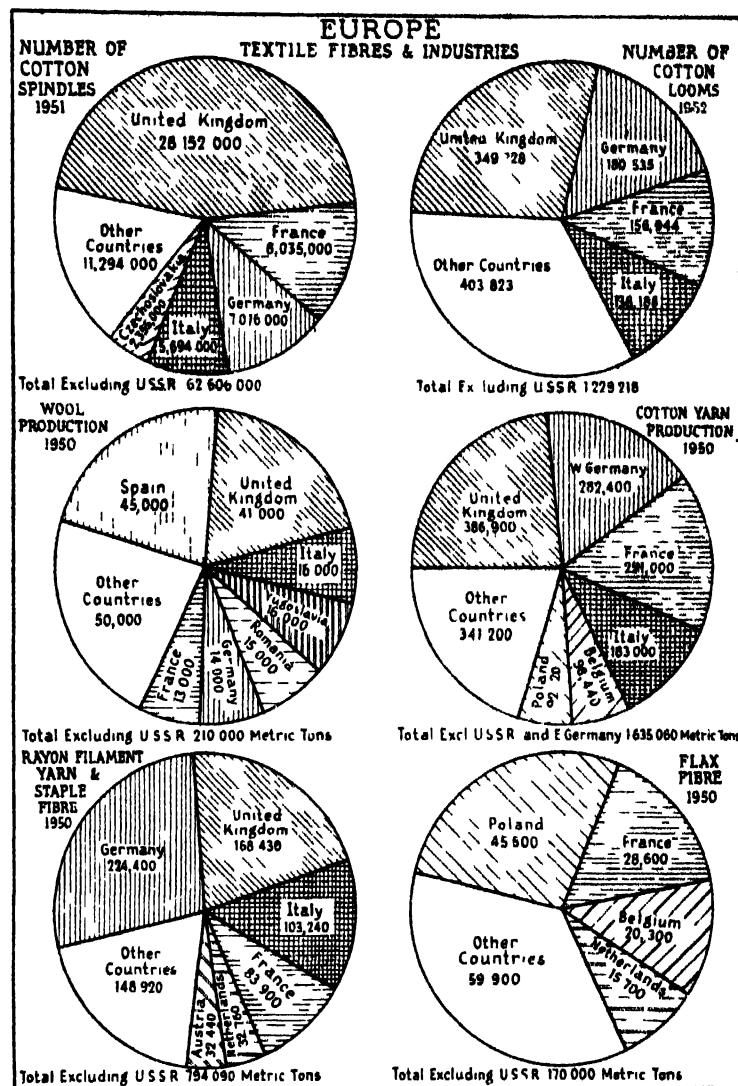
barrier and not a link, and there is seldom a single type of population all round it. But in Europe the centres of such basins are not barren wastes, but generally well filled with water; and the consequent sea or lake is a link and not a barrier, and its margin is not only well peopled, but also reveals a more or less similar type of civilization all round. So one of the worst causes of incoherence in Asia is absent from Europe.

What Comparative Maps

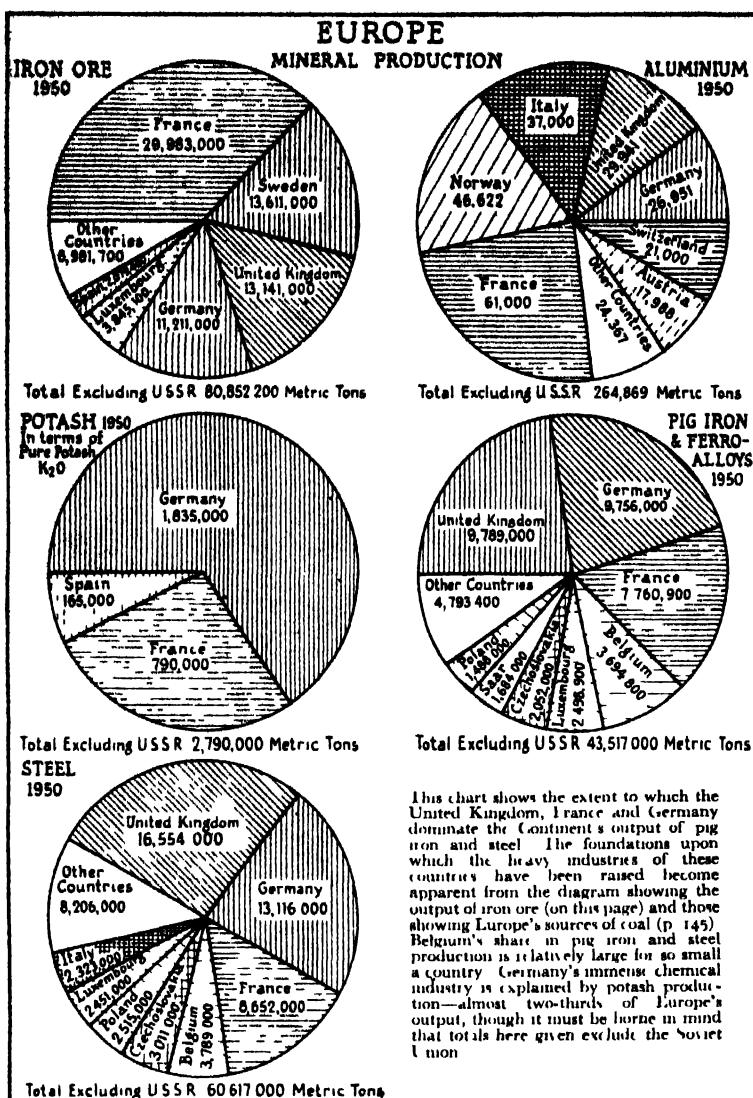
Reveal. But it is of vital importance to keep always in mind that uniformity is as alien to Europe and to European ways of life as general unity is natural; and in that fundamental fact lies the interest of comparative maps of the continent—geological, climatic, political, historic, economic, etc. For instance, a single glance at a political map of Europe shows how unlike the eastern half of the continent, i.e. east of the shortest line between the Baltic and the Black Sea, is to the western half. The eastern half looks like a real piece of Asia; and its western edge, in that Baltic-Black Sea line, actually marks in a rough way a real climatic divide—in the eastern limit of the beech, which is kward by excessive evaporation Russian plain.

The same map may also give an instantaneous suggestion of shape leading naturally and inevitably to division of the whole into subordinate units, each with its own peculiarities or specialities of size, relief, climate, vegetation, and human activities. These minor natural regions led, again almost inevitably, to political sub-divisions; and so the environment helped to evolve the most valuable factor in Europe as a political unit, the Nation State.

A climatic map may give us, though scarcely at the first glance, another aspect of the relation of unity to the absence of uniformity. Everywhere the general "control" may be called, relatively, peninsular and climatic, and the



background is the Atlantic; but the west is complementary to the east in rainfall and in range of temperature, and the north is complementary to the south in seasonal rainfall and in average temperature, 50° Fahrenheit being as typical of summer in the extreme north as of winter in the extreme south. The mean annual temperature falls steadily from south to north and from west to east, but it is nowhere really extreme, and even the seasonal extremes are not great. The same is true of the mean annual rainfall; very little of the whole gets less than one foot or more than five feet of rain. The two-thirds of the continent that lie north of the Alpine line have summer rain, and the one-third to the south of that line has winter rain; and the relation of the belts to the Atlantic gives the ocean ends of both belts



This chart shows the extent to which the United Kingdom, France and Germany dominate the Continent's output of pig iron and steel. The foundations upon which the heavy industries of these countries have been raised become apparent from the diagram showing the output of iron ore (on this page) and those showing Europe's sources of coal (p. 145). Belgium's share in pig iron and steel production is relatively large for so small a country. Germany's immense chemical industry is explained by potash production—almost two-thirds of Europe's output, though it must be borne in mind that totals here given exclude the Soviet Union.

autumn rain. This is as valuable as it is significant, because the ocean has acquired its maximum temperature just when the land is beginning to cool.

A good economic map will reveal equally valuable information. Thus, if one compares the distribution of population with that of grain, we shall see that great exports of grain, e.g. wheat, come only from regions where the population is not dense, or does not consume the particular grain as its standard bread-stuff; generally both conditions are found. But, if we compare the distribution of population with the large-scale export of textiles, we shall find that they come only from areas where the population is dense, and where there is easy access to sources of power and to transport generally, especially coal-fields or oil-fields and

water; and the presence of a vast area of water exercises a climatic control that affects very directly and definitely some textile processes, especially in the case of vegetable fibres, such as cotton and flax.

Man's Influence on Vegetation. The natural vegetation of the continent has been so much modified by man that it is relatively lacking now in significance, but the contrary is true of the economic vegetation; and, historically, the most significant fact is the immense importance of products which are often not specifically associated with Europe.

For instance, the importance of the continent to the wheat and the barley markets of the world is constantly minimized or even ignored. But both grains seem to be natives of the Mediterranean basin, where the cool and moist winter and the hot and dry summer make an ideal climate for them. The yield there, both in total and per acre, is very small; but this is due mainly to poor farming. North of the Alpine frontier of this summer-drought belt, Europe with its summer rain stands far ahead of all the other continents of the world for its output of wheat as the

most valuable of all bread-stuffs; indeed, though the continent is not much larger than either Canada or the United States of America, it produces more wheat than the whole of North America, and has far the highest yield per acre in the world.

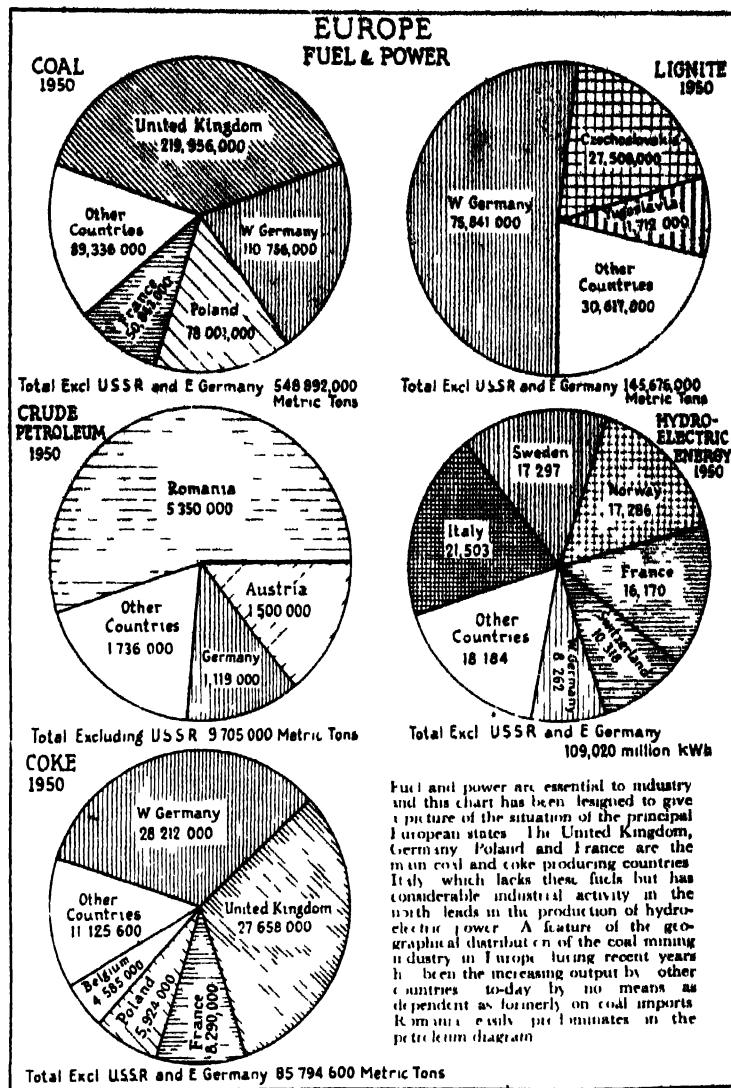
Much the same is true of barley, though it has a wider climatic range than wheat. This range, especially in regard to its power of resisting drought, and the large yield per acre made it the standard bread-stuff of the Greeks and Romans; but the cheapness of the more nourishing wheat and the use of the limited area in the old Greek and Roman lands for more valuable crops have reduced the area to a very small total in all the Mediterranean lands except Spain.

Oats, rye, and clover are also typical crops;

and, again, their relation to the strictly temperate climate of Europe should be emphasized. Like the wheat and the barley, they are "close" crops, with their value in their heads. That is to say, they really cover the ground, and in a double sense, so that they protect the soil from storms of the strength normal in Europe, while their roots hold in the soil the water which does collect; and so, unlike maize and cotton and tobacco, they really protect the ground from erosion by wind or water, which has ruined thousands of square miles in the United States of America.

With regard to mineral wealth any generalizations must be more or less useless, if not actually misleading; but we may assume that any region which is wholly lacking in supplies of the basic minerals is unlikely to make steady progress, and that the conservation—meaning, by that, the proper use—of such irreplaceable products ought to be the instant and intensive preoccupation of any civilized people. For no really civilized people could wish to deprive its own descendants of advantages which they themselves are enjoying, thanks to the self-denial of their predecessors.

When we come to impose the human note on an area of such obvious physical and climatic unity, with the special aim of analysing the fundamental causes that have combined to associate with that unity so much variety and such a valuable absence of uniformity, we find that the unity is largely physical and the variety largely climatic. Everywhere the peninsular forms exercise a relatively uniform control on human activities, even though the peninsulas are distributed over at least two distinct climatic belts; but this has been balanced by the variety of climate. Climate has favoured a marked variety of activities and tendencies by encouraging habits which crystallize into characteristics; and so, while it is very important to



Fuel and power are essential to industry and this chart has been arranged to give a picture of the situation of the principal European states. The United Kingdom, Germany, Poland and France are the main coal and coke producing countries. Italy, which lacks these fuels but has considerable industrial activity in the north leads in the production of hydro-electric power. A feature of the geographical distribution of the coal mining industry in Europe during recent years has been the increasing output by other countries to-day by no means as dependent as formerly on coal imports. Romania easily predominates in the petroleum diagram.

see the whole human note against a background of peninsular unity, it is equally important to give full value to the climatic factors which influence the differences.

For instance, nearly all of the Mediterranean basin in winter comes within the belt of Anti-Trade winds, i.e. winds which are unlike the Trades in character and in direction, being unsteady or variable and westerly or south-westerly. The great sea is, therefore, a belt of low atmospheric pressure, and so forms a natural channel for the eastward passage of cyclonic storms. As these have a double component, one westerly and the other south-westerly, the northern shore of the sea gets much more rain than the southern, and the westward exposures get much more than the eastward.

In summer, on the other hand, the basin is

within the Trade wind belt, near its northern limit; the components of the wind are now northerly and easterly; there is little or no rain; and storms are few and far between. As the winds are also light, "land and sea breezes" are common and strong; and, as the winds are naturally very dry, they have a high evaporating power, and feel cool. These are, of course, the factors behind the remarkable salinity of the Mediterranean waters, although the sea is not actually an enclosed sea.

Some such analysis of the conditions should keep us free from misconceptions about the "Mediterranean" climate, e.g. that it is relaxing—a very common misconception. Why should it be? The height of the encircling mountains gives them heavy snowfall, and winds off snow are not likely to be relaxing; nor are dry winds. The number of rainy days is relatively small, even when the total rainfall is very heavy, e.g. as much as 180 inches behind Cattaro; and so the skies are generally clear, while the relatively low latitude gives a high and powerful mid-day sun and longish days even in winter. No doubt, there are still many strips of malarial lowland; but these have never been densely peopled, they are steadily being cleared up, and visitors can easily avoid them—especially on higher levels, where temperatures are also modified.

The lands, then, occupied by the southern peoples of Europe are mainly long and narrow belts between mountains and sea, with great uniformity of structure and relief, climate and vegetation. As they are so narrow and so mountainous, agriculture is generally concerned with hill-terracing, work more suited to bush and tree than to grain and roots; but the variety of level and exposure favours a variety of crops, so that the early peoples were able to provide themselves with all the necessities of life. As these conditions are normal almost everywhere, there tended to be marked community of culture all round the basin. The unity of political control under the first great European empire—the Roman Empire—emphasizes this, even if such unity was much broken into in later centuries by the inroads of Arabs and Turks.

Western Europe is not so much a natural unit as southern Europe; but it is entirely in the Anti-Trade belt, it has abundance of fertile and healthy lowland, it does not suffer regu-

larly from summer drought, and its westerly position protected it from the worst effects of the Barbarian invasions from Asia which broke up the Roman Empire. Above all it is "Atlantic" in its opportunities and its activities as well as in climate.

Northern Europe is a small division, distinguished by much ancient rock, which weathers very slowly into very unfertile soil, by much high relief, and by difficulties of access. The absence of coal and the presence of timber have been important features in the development of the area; and in recent years the abundance of fine iron-ore has been very important.

Eastern Europe is unlike the rest of the continent because it is almost a perfect unit in spite of its great area. In structure and relief it is a single vast expanse of low and level land, making one of the great plains of the world. The entire absence of high relief means an absence of features which often make useful climatic and political boundaries; and so, though the great differences of latitude (nearly 2000 miles) mean great differences in the height of the mid-day sun and the length of the days in the extreme north and the extreme south, the temperature belts and their associated vegetation belts merge into one another gradually or even imperceptibly; and so there is little or nothing to modify the paralysing monotony of the environment.

All the rest of the continent may be included in central Europe, but it is important to understand the title. Although the area goes by a single name, to distinguish it from the well-defined surrounding areas, it is not a single unit. As a matter of strict fact, the area has no unity whatever—structural, relief, climatic, historic, racial or political. It has at least three structural and relief belts. Though all have cold winters and warm summers, the climate is so lacking in unity that, while north central Europe is naturally the home of forest, south central Europe is the home of steppe; and there is no greater vegetational contrast than that between forest and steppe, representing the longest-living and the shortest-living of plants. A somewhat similar contrast exists between east and west, for the western area is almost as temperate and as variable as western Europe, while the eastern is almost as stable and extreme as Russia.

EUROPE : FACTS AND FIGURES

Area:
10,629 square miles

ALBANIA

Currency:
100 quintars = 1 lek

Population (1950 estimate): 1,200,000. **Density:** 113 per square mile. **Capital City:** Tirana (30,800).
Other Large Town: Shkodër (29,200).

Communications:

Motor roads: 1400 miles.

Principal Products:

Tobacco; timber; wool; hides, furs; dairy products; fish; olive oil.

Industries:

Flour milling; olive pressing; cheese making; forestry.

Minerals:

Salt; bitumen; oil; asphalt and coal.

Other Particulars:

Type of State: Republic with a Constituent Assembly formed in 1946.

Area:
32,393 square miles

AUSTRIA

Currency:
100 groschen = 1 schilling

Population (1950 estimate): 6,919,000. **Density:** 210 per square mile. **Capital City:** Wien (Vienna) 1,760,800.

Chief Cities: Graz (226,300); Linz (185,200); Innsbruck (94,600). (1950 figures.)

Communications (1950):

Railways: 3780 miles.
Roads: 53,750 miles.

Principal Products:

Timber; rye; oats; wheat; barley; maize; potatoes; sugar beet.

Industries:

Dairying; farming; steel; copper and lead working.

Minerals:

Iron ore; lead; zinc; copper; bauxite; manganese; lignite; coal; petroleum.

Other Particulars:

In 1938 Austria was joined to Germany by an *Anschluss*. It was occupied by the Allies in 1945 and under a Military Government it was made an independent, democratic republic.

Area:
11,754 square miles

BELGIUM

Currency:
100 centimes = 1 franc

Population (1950 estimate): 8,640,000. **Density:** 735 per square mile. **Capital City:** Bruxelles (966,482).
Chief Towns: Anvers (261,412); Gand (166,171); Liège (156,193). (1950 figures).

Communications (1950):

Railways: 3,144 miles.
Roads: 5,767 miles.
Navigable waterways, 1,105 miles.
Mercantile Marine, 94 vessels (305,000 tons).

Chief Crops:

Oats; wheat; rye; potatoes; sugar beet.

Industries:

Coal; iron and steel; copper; sugar; alcohol.

Other Particulars:

Type of State: Kingdom. **Arable land:** (including Eupen and Malmédy) 65 per cent of the total area.

Area:
42,796 square miles

BULGARIA

Currency:
100 stotinki = 1 lev

Population (1950 estimate): 7,200,000. *Density*: 168 per square mile. *Capital City*: Sofiya (435,000). *Chief Towns*: Plovdiv (Philippopolis) (125,500); Varna (77,800); Ruse (Ruschuk) (53,420).

Communications:

Railways: 2211 miles.
Roads: 19,638 miles.

Mercantile Marine: 2 vessels (3418 tons).

Chief Crops:

Wheat; rye; barley; oats; maize; grapes; tobacco.

Minerals:

Coal; aluminium; salt.

Other Particulars:

Type of State: Republic. *Cultivated Land*: 39 per cent of total area. *Urban population*: 21.5 per cent of total. *Rural population*: 78.5 per cent. *Towns over 20,000 population*: 12.

A peace treaty was signed in February, 1947, whereby the frontiers were to remain as they were in 1939 except that Southern Dobruja was to be included. This had been ceded to Bulgaria by Romania in 1940.

Area:
49,400 square miles

CZECHOSLOVAKIA

Currency:
100 haller = 1 koruna

Population (1950 estimate): 12,513,000. *Density*: 253 per square mile. *Capital City*: Praha (922,300).

Chief Towns: Brno (273,100); Ostrava (181,000); Bratislava (172,700); Plzeň (117,800).

Communications:

Railways: 8200 miles.
Roads: 44,200 miles.

Chief Crops:

Wheat, rye; barley; oats; potatoes; sugar beet; maize.

Agricultural Industries:

Sugar; beer; spirits; malts; foodstuffs.

Minerals:

Coal; iron; graphite; silver; copper and lead; rock salt.

Industries:

Furniture and bent wood; glass; paper; chemicals.

Other Particulars:

A republic that was formed after the 1914-18 war from the old Austria-Hungary. In 1939 it was invaded by Germany but was liberated in 1945 and again recognized as an independent state. Ruthenia was ceded to Russia in 1945.

Area:
16,576 square miles

DENMARK

Currency:
100 ore = 1 krone

Population (1950 estimate): 4,280,000. *Density*: 252 per square mile. *Capital City*: Kjobenhavn (974,900).
Chief Towns: Aarhus (116,200); Odense (100,900). (1950 figures).

Communications (1950):

Railways: 3000 miles.

Roads: 5100 miles.

Mercantile Marine: 1057 vessels (1,200,000 tons).

Chief Crops:

Potatoes; barley; oats; rye; wheat.

Industries:

Dairy farming; fisheries; brewing; distilling.

Other Particulars:

Type of State: Kingdom. *Arable land*: 63 per cent of total. *Towns with over 50,000 population*: 4.

Area:
130,162 square miles

FINLAND

Currency:
100 penni = 1 markka

Population (1950 estimate): 4,033,000. *Density*: 31 per square mile. *Capital City*: Helsinki (367,450).
Chief Towns: Turku (Abo) (101,240); Tampere (103,050); (1950 figures).

Communications (1950):

Railways: 2900 miles.

Main roads: 16,230 miles.

Inland waterways (navigable): 2700 miles.

Inland waterways (floatable): 26,500 miles.

Mercantile Marine: 652 vessels. 568,000 tons.

Chief Crops:

Rye, barley; oats; potatoes; hav.

Industries:

Wood; pulp and paper; textiles; leather; furs.

Other Particulars:

Type of State: Republic. *Cultivated land*: 17 per cent of total area. *Urban population*. 25.59 per cent.
Rural population. 74.41 per cent.

A Peace Treaty was signed with the Allies in February, 1947, whereby Finland ceded to Russia the Karelian Isthmus, Viborg, the territory west of Lake Ladoga and Petsamo province. She thus lost direct access to the Arctic Ocean.

Area:
212,659 square miles

FRANCE

Currency:
100 centimes = 1 franc

Population (1950 estimate): 41,900,000. *Density*: 196 per square mile. *Capital City*: Paris (2,725,374). *Chief Towns*: Bordeaux (253,751); Lille (188,871); Nice (211,165); Toulouse (264,411); Lyons (460,748); Marseilles (636,264).

Communications (1950):

Railways: 25,794 miles.

National roads: 50,150 miles.

Navigable waterways: 8268 miles.

Mercantile Marine: 700 vessels (2,966,000 tons).

Chief Crops:

Wheat; potatoes; oats; grapes.

Minerals:

Coal; iron; lignite; bauxite; potash salts.

Industries:

Textiles; alcohol; sugar; metallurgical.

Other Particulars:

Type of State: Republic. *Arable land*: 38 per cent of total. *Towns with over 100,000 population*: 22. *Towns over 50,000*: 54.

Area:
137,390 square miles

GERMANY

Currency:

100 deutschepfennige = 1 deutschemark

Population (1950 estimate): 68,200,000. **Density:** 496 per square mile. **Capital City:** Berlin (3,187,500).

Chief Towns: Dresden (468,000); Essen (605,400); Hamburg (1,600,000); Köln (595,000); Leipzig (607,700); München (832,000). (1950 estimates).

Communications (1950):
(Federal Republic)

Railways: 19,206 miles.

Roads: 79,760 miles.

Inland waterways: 2860 miles.

Industries:

Iron and steel (Ruhr, Westphalia); chemicals (Bavaria, Prussian Saxony); electrical (Berlin); textiles (Saxony); sugar beet; glass; porcelain; brewing and distilling.

Chief Crops:

Wheat; rye; barley; oats; potatoes; sugar beet; hay.

Minerals:

Coal (Westphalia, Ruhr, Saxony); brown coal (central Germany); iron (Harz, Westerwald); copper (Harz); potash; rock salt.

Other Particulars:

Towns over 500,000 population: 9. Towns over 100,000: 56

Germany, after the war of 1939-45, returned to her 1937 frontiers, except that she lost parts of Brandenburg, Pomerania and Silesia when the German-Polish frontier was provisionally fixed along the Oder-Neisse line at Potsdam in 1945.

Area: (including the Dodecanese)
51,182 square miles

GREECE

Currency:

100 lepta = 1 drachma

Population (1950 estimate): 7,604,000. **Density:** 148 per square mile. **Capital City:** Athenai (559,250).

Chief Towns: Peiraeus (185,000); Thessalonike (418,000). (1950 figures).

Communications (1950):

Railways: 1700 miles.

Roads: 8500 miles.

Mercantile Marine: 400 vessels.

Chief Crops:
Wheat; barley; maize; olives; grapes; oats; currants; tobacco; cotton.

Minerals:

Iron; pyrites; emery; copper; zinc; lead; silver; manganese; aluminium; antimony; nickel; magnesite.

Other Particulars:

Type of State: Kingdom. **Mainland area:** 41,328 square miles. **Island area:** 9,854 square miles. **Towns over 50,000 population:** 5.

Area:
35,902 square miles

HUNGARY

Currency:
100 filler = 1 forint

Population (1950 estimate): 9,210,000. **Density:** 256 per square mile. **Capital City:** Budapest (1,058,300).
Chief Towns: Debrecen (126,000); Szeged (140,000).

Communications:

Railways: 5500 miles.

Roads: 19,000 miles.

Navigable rivers: 687 miles.

Mercantile Marine: 514 vessels (118,717 tons).

Chief Crops:
Wheat; rye; barley; oats; maize; potatoes; sugar beet; grapes.

Industries:

Milling; distilling; sugar; hemp.

Minerals:
Bauxite; bituminous coal; lignite.

Other Particulars:

Arable land: 60.2 per cent of total. *Towns with over 50,000 population:* 13.

Hungary became a Republic in 1946. Under the Peace Treaty signed in 1947, her frontiers, with the exception of a small area ceded to Czechoslovakia, were confirmed as those existing in 1938.

Area:
39,709 square miles

ICELAND

Currency:
100 öre = 1 króna

Population (1950 estimate): 144,300. **Density:** 4 per square mile. **Capital City:** Reykjavik (56,000) (1950).

Communications (1950):

Roads: 3500 miles.

Mercantile Marine: 550 vessels (90,500 tons).

Chief Crops:

Hay, potatoes; turnips.

Industry:

Fishing (herring and cod).

Other Particulars:

Type of State: Independent Republic from 1944. *Cultivated land:* 15 per cent of total area. *Urban Population:* 58 per cent. *Rural:* 42 per cent.

Area:
119,759 square miles

ITALY

Currency:
100 centesimi = 1 lira

Population (1950 estimate): 46,272,000. **Density:** 393 per square mile. **Capital City:** Roma (1,665,670).

Chief Towns: Genova (676,100); Milano (1,289,300); Napoli (1,029,800); Torino (730,570).
(1950 estimates).

Communications (1950):

Railways: 13,519 miles.

National roads: 13,545 miles.

Mercantile Marine: 4260 vessels (2,292,000 gross tons).

Chief Crops:
Wheat; maize; grapes; olives; beans; oats.

Minerals:

Pyrates; iron; bauxite; zinc; mercury; lead.

Other Particulars:

Type of State: Republic. *Towns with over 100,000 population:* 25; *over 50,000:* 54.

Under the Peace Treaty of 1947 Italy ceded to France certain lands in the North, namely the Little St. Bernard Pass, Mont Cenis plateau, Mont Tabort-Chaberton Area and the Tenda-Briga Area. The Italo-Yugoslav frontier was also revised in favour of Yugoslavia. Trieste was made a Free Territory.

Area:
12,868 square miles

NETHERLANDS

Currency:
100 cents = 1 guilder (florin)

Population (1950 estimate): 10,200,000. **Density:** 715 per square mile. **Capital City:** Den Haag (560,000). **Chief Towns:** Amsterdam (845,270); Eindhoven (144,000); Groningen (137,720); Haarlem (164,000); Rotterdam (684,660); Utrecht (195,100). (1950 figures).

Communications (1950):

Railways: 2000 miles.

Roads: 7800 miles.

Rivers and Canals: 4375 miles.

Mercantile Marine: 1200 vessels (3,000,000 tons).

Chief Crops:

Wheat; rye; barley; oats; peas; potatoes; sugar beet; flax.

Industries:

Dairying; finishing industries connected with colonial products; brewing; distilling; electrical; coal.

Other Particulars:

Type of State: Kingdom. Inland waters totalling 3079 square miles are included in the total area. **Urban population:** 94 per cent. **Rural population:** 6 per cent (communities of over 2000 counting as Urban).

Area:
124,556 square miles

NORWAY

Currency:
100 öre = 1 krone

Population (1950 estimate): 3,280,000. **Density:** 26 per square mile. **Capital City:** Oslo (429,000).

Chief Towns: Bergen (110,500); Trondheim (57,130).

Communications (1950):

Railways: 2800 miles.

Roads: 27,900 miles.

Mercantile Marine: 2170 vessels (5,500,000 tons).

Chief Crops:

Wheat; barley; oats; potatoes; hay.

Minerals:

Pyrites; iron.

Industries:

Pulp and paper; fisheries; canning.

Other Particulars:

Type of State: Kingdom. **Urban population:** 32 per cent. **Rural:** 68 per cent. **Cultivated land:** 3·6 per cent. **Forest:** 24·2 per cent. **Unproductive:** 72·2 per cent. **Towns over 25,000 population:** 6.

Area:
121,131 square miles

POLAND

Currency:
100 grosz = 1 zloty

Population (1950 estimate): (24,977,000). *Density*: 206 per square mile. *Capital City*: Warszawa (600,000). (1950).

Communications:

Railways: 14,400 miles.

Roads: 60,000 miles.

Waterways: 3000 miles.

Mercantile Marine: 43 vessels (161,312 tons).

Chief Crops:

Rye; potatoes; oats; wheat; barley; sugar beet; flax; hemp; hops; chicory.

Minerals:

Coal; petroleum; natural gas; salt; iron; zinc.

Industries:

Coal; textile; metallurgical; naphtha and oil refining.

Other Particulars:

Type of State: Republic. *Urban population*: 27·2 per cent of total. *Rural*: 72·8 per cent.

Under the 1945 Potsdam Agreement the Western frontier was made along the line of the Oder and Neisse rivers, thus including much ex-German land with the towns of Stettin, Liegnitz and Breslau. Danzig and part of East Prussia are also included in Poland.

Area:
34,500 square miles

PORTUGAL

Currency:
100 centavos = 1 escudo

Population (1950 estimate): 8,490,000. *Density*: 246 per square mile. *Capital City*: Lisboa (705,000). *Other Large Town*: Porto (262,500). (1950 estimate).

Communications (1950):

Railways: 2240 miles.

Mercantile Marine: 326 vessels (447,800 tons).

Chief Crops:

Wheat; maize; oats; barley; potatoes; olives; grapes.

Industries:

Fishing; resin; turpentine; cork.

Other Particulars:

Type of State: Republic; since 1933 a Corporative State. *Cultivated land*: 60 per cent of total.

AZORES AND MADEIRA. *Area*: 1196 square miles. *Population*: 584,400. *Density*: 488 per square mile.

Area:
91,671 square miles

ROMANIA

Currency:
100 bani = 1 leu

Population (1949 estimate): 15,873,000. *Density*: 173 per square mile. *Capital City*: Bucuresi (1,041,807). *Chief Towns*: Jassy (108,987); Ploesti (105,114); Galatz (93,229); Timisoara (108,296) (1948 figures).

Communications (1948):

Railways: 5962 miles.

Roads: 43,163 miles.

Mercantile Marine: 15 vessels (32,962 tons).

Chief Crops:

Wheat; rye; barley; oats; maize.

Minerals:

Salt; lignite; iron; copper; petroleum.

Other Particulars:

Type of State: Republic. *Arable land*: 45 per cent of total. *Urban population*: 30 per cent. *Rural*: 70 per cent.
Towns with over 50,000 population: 15.

Under the 1947 Peace Treaty, Romania ceded Bessarabia and Northern Bukovina to Russia and Southern Dobruja to Bulgaria.

Area:
190,674 square miles

SPAIN

Currency:
100 centesimos = 1 peseta

Population (1950 estimate): 28,287,000. *Density*: 148 per square mile. *Capital City*: Madrid (1,609,500). *Chief Towns*: Barcelona (1,280,200); Malaga (276,200); Sevilla (376,600); Valencia (509,100). (1950 figures).

Communications (1950):

Railways: 12,950 miles.

Roads: 69,050 miles.

Mercantile Marine: 1400 vessels (1,206,000 tons).

Chief Crops:

Wheat; barley; grapes; olives.

Minerals:

Coal; anthracite; iron; iron pyrites; copper; lead.

Other Particulars:

Type of State: Republic. *Arable land*: 32 per cent of total area. *Towns over 100,000 population*: 24; over 50,000: 49.

BALEARIC AND CANARY ISLANDS: Area: 4275 square miles.

Area:
173,403 square miles

SWEDEN

Currency:
100 öre = 1 krona

Population (1950 estimate): 7,046,000. **Density:** 41 per square mile. **Capital City:** Stockholm (745,900).

Chief Towns: Göteborg (354,000); Malmö (192,500). (1950 figures).

Communications (1950):

Railways: 10,400 miles.

Wheat; rye; barley; oats; potatoes; sugar beet.

Roads: 56,560 miles.

Chief Crops:

Mercantile Marine: 2200 vessels (2,203,200 tons).

Iron; silver; lead; copper; zinc; manganese; gold.

Industries:

Wood and paper; textiles; iron and steel; porcelain; glass.

Minerals:

Other Particulars:

Type of State: Kingdom. **Arable land:** 8·3 per cent of total area. **Forests:** 52·2 per cent of total area. **Urban population:** 34 per cent of total. **Rural:** 66 per cent. **Towns over 50,000 population:** 41.

Area:
15,944 square miles

SWITZERLAND

Currency:
100 rappen (centimes) = 1 franc

Population (1950 estimate): 4,715,000. **Density:** 296 per square mile. **Capital City:** Berne (146,500).

Chief Towns: Basle (183,550); Genève (145,500); Lausanne (106,800); Zurich (390,000). (1950 figures).

Communications:

Railways: 3250 miles.

Chief Agricultural Products:

Roads: 10,200 miles.

Milk; cattle; pigs; fruit; poultry.

Industries:

Cheese; condensed milk; watches and clocks; salt.

Other Particulars:

Type of State: Confederation of Cantons. **Population engaged in industry:** 43·5 per cent. **Land:** unproductive, 22 per cent; forests, 23 per cent; cultivated and pasture, 55 per cent.

Area:
99,181 square miles

YUGOSLAVIA

Currency:
100 paras = 1 dinar

Population (1950 estimate): 16,250,000. **Density:** 163 per square mile. **Capital City:** Beograd (389,100).

Chief Towns: Sarajevo (118,800); Subotica (112,550); Zagreb (290,700). (1948 figures).

Communications (1949-50):

Railways: 7150 miles.

Grapes; maize; wheat; barley; oats; rye.

Roads: 30,350 miles.

Minerals:

Waterways: 1300 miles.

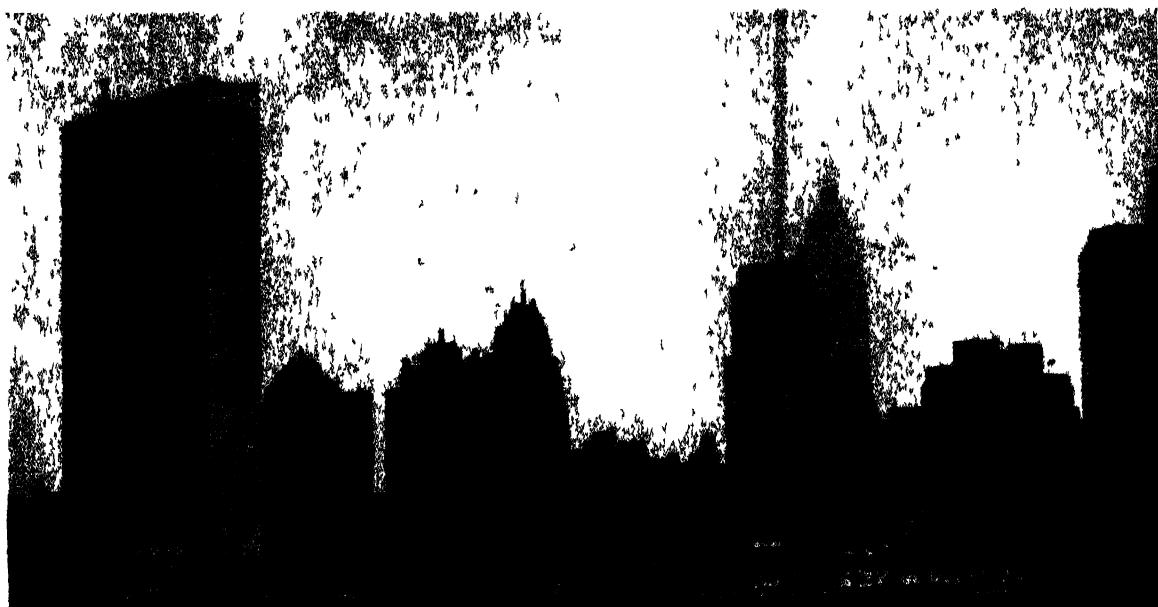
Lignite; iron; copper; gold; lead; chrome; antimony.

Mercantile Marine: 126 vessels (222,800 tons).

Other Particulars:

Type of State: Republic. **Cultivated land:** 54 per cent of total area. **Towns over 50,000 population:** 11.

THE UNITED NATIONS AND EUROPEAN CO-OPERATION



THE PERMANENT HOME OF THE UNITED NATIONS
The impressive building (*left*) seen from across the East River New York, when nearing completion
Photo Keystone

THE United Nations formally came into existence on 24th October, 1945. It consists of an association of states which have pledged themselves, through signing the United Nations' Charter, to maintain international peace and security and to co-operate in establishing political, economic and social conditions under which this task can be achieved. The original member states were 51 in number. By 1953 this total had increased to 60.

Specialized Agencies brought into relationship with the United Nations include the International Labour Organization (ILO), the Food and Agricultural Organization (FAO), The United Nations Educational, Scientific and Cultural Organization (UNESCO), the World Health Organization (WHO), the International Monetary Fund (FUND), the International Civil Aviation Organization (ICAO), the Universal Postal Union (UPU), the International Telecommunications Union (ITU) and, until January, 1952, the International Refugee Organization (IRO).

The *United Nations Relief and Rehabilitation*

Administration (UNRRA) was the first United Nations Agency to be established, in 1943. Its purpose was the provision of emergency supplies and services for those countries which, as a result of Axis aggression, required assistance. The transfer of residual funds and activities to the United Nations and some of the Specialized Agencies was completed by March, 1949.

Side by side with the setting up of these and other international bodies, such as the *World Council of Churches* constituted at Amsterdam in 1948 with the object of promoting common action in religious and allied matters, there were established certain other organizations charged with the specific duty of developing co-operation between European countries in tackling the social, political and economic problems of the time.

Prominent among these was the *Organization for European Economic Co-operation* (O.E.E.C.). This consisted originally of Austria, Belgium, France, Denmark, Greece, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Sweden, Switzerland, Turkey and

the United Kingdom, and its primary objects were to foster co-operation among the member countries and to assist the operation of the Marshall Plan aiming at economic recovery in Europe. These sixteen nations were subsequently joined first by Trieste and then by the Federal Republic of Germany. The U.S.S.R. and her satellite states in central Europe have declined to belong to O.E.E.C.

Working in close collaboration with O.E.E.C. is the *Mutual Security Agency*, an American organization which in 1951 replaced the former *Economic Co-operation Administration* (E.C.A.) created in 1948 to administer the Marshall Plan.

In July, 1950, a *European Payments Union* (E.P.U.) was formed at the instigation of O.E.E.C. in order to facilitate the settlement of the surpluses and deficits of each of the member countries through the instrument of a central clearing house.

In the political field there have been corresponding developments, some of them closely bound up with the solution of economic and cognate problems.

The Brussels Treaty Organization is the result of an idea put forward by General Smuts in 1943, and its object is the political association of the democracies of Western Europe. Out of it have sprung the following agreements—

The Anglo-French Treaty signed at Dunkirk on 4th March, 1947.

An Anglo-French Economic Committee set up in September, 1946.

The Benelux Customs Union between Belgium, the Netherlands and Luxembourg.

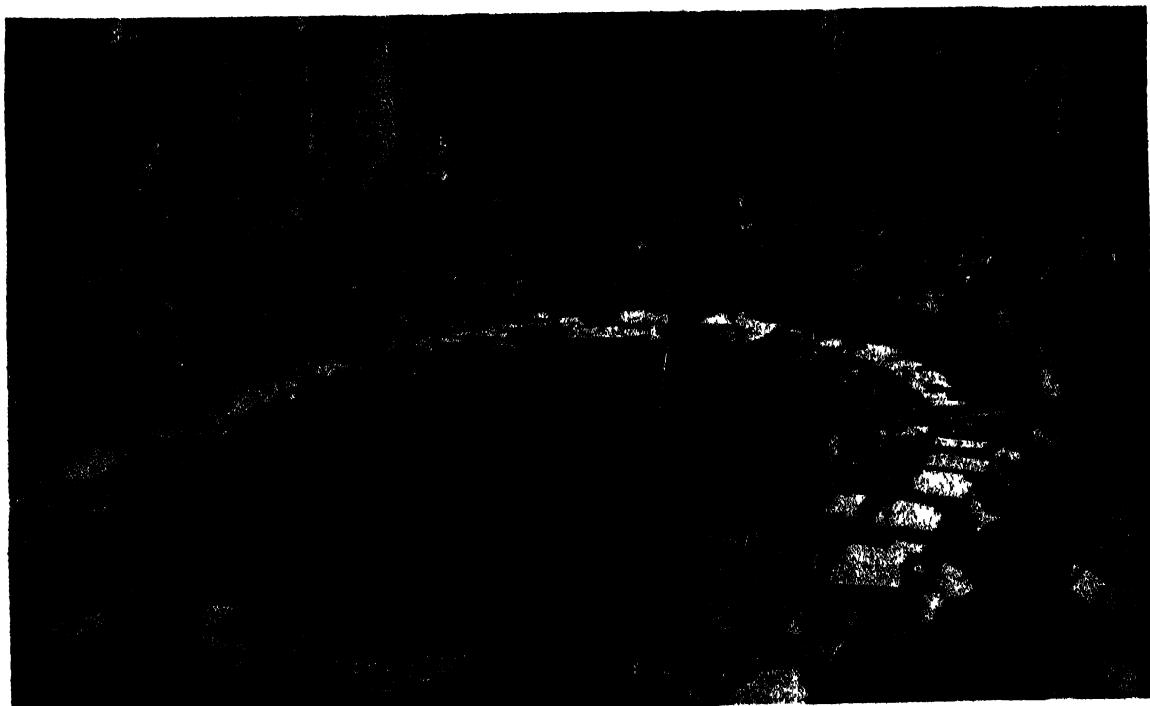
The Franco-Italian Customs Union.

Colonial Co-operation (allowing for exchange of views on administrative and technical problems between the colonial authorities of the U.K. and France in Africa, and later extended to include those of Belgium and Portugal).

The Council of Europe, established in May, 1949, whose aim is to "achieve a greater unity between its members for the purpose of safeguarding and realizing the ideals and principles which are their common heritage and facilitating their economic and social progress."

The Brussels Treaty powers were also responsible, in conjunction with the United States and Canada, for the creation of the *North Atlantic Treaty Organization* (N.A.T.O.) in August, 1949.

All these efforts have a common aim and are a welcome sign in a world that shudders at the awful consequences of anything in the nature of a third world war.



NORTH ATLANTIC PACT DEFENCE MINISTERS AT THE HAGUE, APRIL, 1950

Following this meeting it was announced that an overall strategic plan to protect their countries from aggression had been agreed

Photo: Keystone

FRANCE

(With Corsica and Monaco)

AN Englishman who travelled through France in the seventeenth century summed up his impressions in this way: "France is a truly noble and fertile State. It is the most favoured by Nature of all that are in the world." This is true. If France is no longer what has been called "the most beautiful kingdom after that of Heaven," she is still as regards climate, fertility of the soil, richness of mineral deposits, and variety of landscape, the most privileged country in Europe. Indeed, the word that best describes her is "diversity," for which she is equally remarkable in human types; in soil, rivers, plains and plateaux, in hills and mountains; in cattle and game; in trees and vegetables, flowers and fruit. France is a universe in miniature, and yet, in spite of this infinite variety of people and of things, there exists

between the different provinces a mysterious link that gives this country, with its old civilization, an aspect of unity, of harmony.

If the sea were to rise some 700 feet, one half of France would be under water, the submerged part lying almost entirely to the north-west of a line drawn from Mézières, in the Ardennes, near the Belgian frontier, to Bayonne, in the Basses-Pyrénées, close to the Spanish border on the Atlantic. This half of the country is a series of great plains that are only slightly broken by the chains of little hills in Normandy, Brittany and Poitou. The rest of the country, to the south-east of the line from Bayonne to Mézières, is a region of mountains and table-land, almost the only plains being those of Champagne, the Vallées of the Rhône and the Saône, part of Berry, and La Camargue in Lower Languedoc.

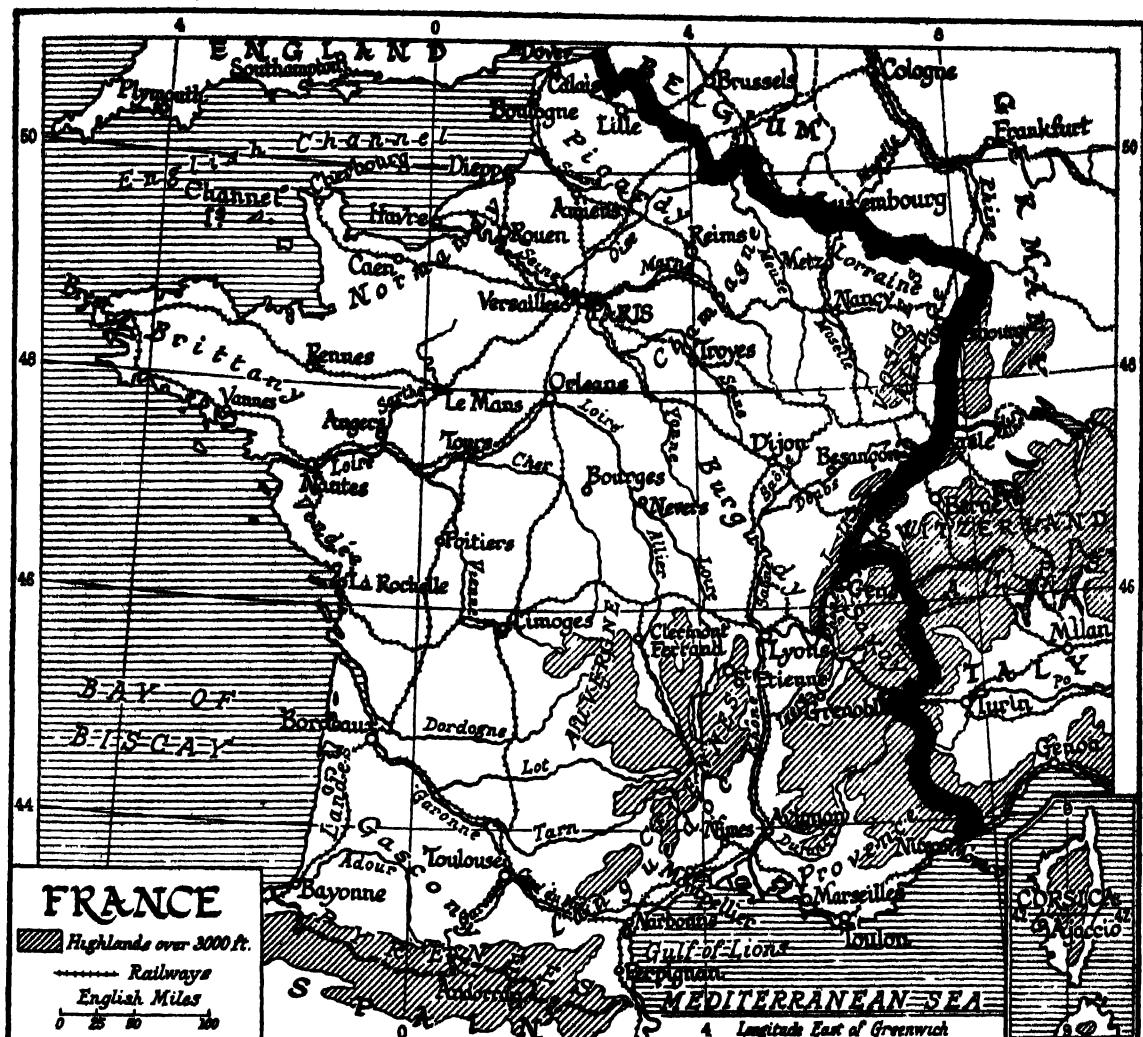
The Land and the People

THE greater part of the plains is cultivated intensively and the chief product is corn, which is grown especially in the centre and in the north, which also produce large quantities of beetroot, flax and hemp. Oats, rye and potatoes are widely distributed and so are clover and lucerne. And then there is tobacco, for France produces half the tobacco she consumes. This is a State monopoly and about twenty-five departments are authorized to grow it. About two-thirds of it is grown in the Garonne Basin and the rest comes from the departments of Le Nord and the Pas de Calais.

After the cereals in importance comes the vine, which grows principally in three districts: Bordeaux, whence comes claret, Burgundy, and the south. All the wines from these districts have their characteristic flavour as have also the wines in the smaller groups, the Valley of the Rhône, Anjou, Touraine, Champagne

with its famous sparkling wines, and Charentes with its cognacs and armagnacs.

Throughout France, but especially in Picardy, in Normandy and Brittany, and along the damp Atlantic coast, there is good grazing for beasts, cattle and sheep of various breeds. Normandy butter is one of many excellent kinds, and where there are good cows there is good cheese. There are numbers of delectable local cheeses that never find their way into the open markets, but of those that do, the Camembert, the Pont l'Évêque, Brie and Gruyère are the best known. Roquefort is made in the Aveyron, from the milk of goats. The famous "pré-salé" mutton from the salt marshes at the mouth of the River Somme is in great demand. Pigs flourish in Brittany, Gascony, Lorraine, the Limousin, and in Périgord, where they are used to root up the delicious truffles. Horses are found all over



ALTERNATIVE PLACE NAMES FOR TOWNS SHOWN ON THIS MAP
 Brussels—Bruxelles; Cologne—Köln; Milan—Milano; Turin—Torino; Genoa—Genova; Geneva—Genève

France, but they are all draught horses, riding, carriage and race horses, bred in the northern provinces, from Normandy and Brittany across to Lorraine, where there is the best fodder. In the south the small farmer depends mainly on the asses and mules from Poitou, the Berry and the Pyrénées, for his transport, especially in the mountains.

The Forests. Rather more than a sixth part of France is covered with forests. They are widely distributed, but the greater number of them cover the slopes of mountains and hills and the less fertile land. The most famous are those of Fontainebleau, Compiègne, Chantilly and Rambouillet, all in the Ile de France, near Paris; they are most numerous in the eastern departments of the Vosges and the Jura, and the Forest of Orléans is the largest of all. Oaks,

beeches, pines and larches grow in the forests, elms in the fields, poplars along the roadside (there are quince hedges in Tarn et Garonne), and cork trees along the southern coast.

From the quantities of pears and apples in Normandy and Brittany they make cider and Perry that are very like the English drinks. Auvergne and the centre generally have a profusion of cherries, peaches and apricots, whilst olives, almonds and figs, oranges and lemons, flourish under the warm southern sun. Mulberries grow all along the Rhône Valley, and Lyons draws its trade and wealth from the silkworms that feed on their leaves.

The inhabitants of the coastal towns and villages are fishermen, and France gets her herrings from the English Channel, her sardines and mackerel from the coast of Brittany and



A SCENE IN NORMANDY

A courtyard of one of the many half-timbered houses in this part of France

Photo Keystone

from the Mediterranean, where they catch a number of other fish, many of which are strange to northern waters. Every year ten thousand Bretons leave their homes for the cod-fisheries of Newfoundland.

Rivers and Mountains. The rivers of France are legion. First the four mighty streams, the Seine, the Loire, the Garonne, the Rhône; their tributaries, the Somme, the Charente, the Aude; the Moselle, tributary of the Rhine, and the great Rhine itself. All these rivers have numerous tributaries, and they, together with a remarkable system of canals, provide a splendid network of water-transport all over France. They are lovely in their valleys and their waters are full of fish.

High mountains, the Vosges, the Jura, the Alps, rise in the east, and the two latter ranges form the frontier of France with Switzerland and Italy; to the south-west, the Pyrénées stand between her and Spain. Down the centre runs the Massif Central.

Provinces. France was divided into thirty-six provinces before 1790, but then the Constituent Assembly of the Revolution, to facilitate administration, divided it into eighty-three departments, since augmented to ninety. Most of these are called either after their rivers or their mountains; some, like the Nord, rather vaguely after their geographical position. They all have a *chef-lieu* or county town and are governed, as far as local matters are concerned, by a prefect to whom the mayors of the "communes" or parishes, are responsible. The prefect is a civil servant and thus responsible to the Government. In this way there is a much closer connection between the central and local government than exists in England. But the French still think of their country in provinces, for these mark the racial divisions of which, although "La Patrie" always comes first, they are proudly conscious.

Brittany. A traveller who leaves Southampton for France will land at St. Malo on the River Rance, now a respectable Breton port, but formerly a nest of pirates who infested the western seas. The town is proud of its imposing seventeenth century ramparts that were built by Vauban, the great military architect who constructed chains of fortresses throughout France for Louis XIV. From here the fishing fleets, first blessed by the Archbishop of Rennes, start on their long voyage to the coast of Newfoundland in search of cod.

The inner lands of Brittany are endless moors covered with gorse and broom, where all seemed changeless until the defeat of 1940. But here and there the hardworking Breton has tried to wring a living from the barren soil, and here and there he has left traces of his creative imagination. The coast is heavily indented. The remorseless waves have vanquished the grey granite and have worn it into an infinite number of creeks and inlets. The perpendicular cliffs, the many isolated rocks, and the scattered islets off the coast, give an idea of the terrible destruction that the elements have wrought through the centuries.

The coast land of Britanny bears the old name of Armor, Land of the Sea, and here was first created the "Homard à l'Armoricaine," now corrupted into "Homard à l'Américaine." But the Armoricans themselves have not forgotten. The northern coast of Armor is a succession of bays and estuaries, ports and seaside towns. Opposite St. Malo, on the other

side of the mouth of the Rance, stands Dinard, and farther up that greenest of valleys is Dinan, the old, and its Castle in which lived Anne of Brittany. To the west lie St. Brieuc, Paimpol with its rose-coloured rocks, Tréguier, Lannion, Morlaix, each with its special charm.

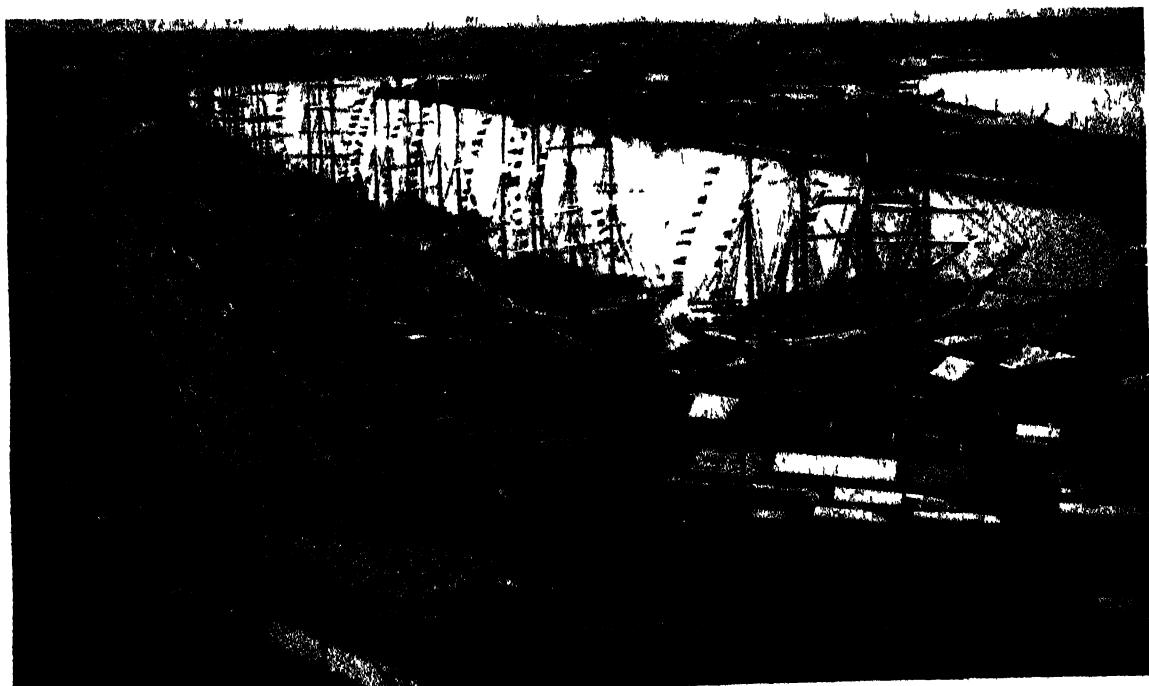
The western coast, Finistère, the "End of the Earth," shelters the harbour of Brest, south of which is the large Bay of Douarnenez, so protected by Cap Finistère and the savage majesty of the Pointe du Raz that the sardine boats do their fishing there when the gales forbid them the open sea. But south of the Pointe du Raz there is nothing to break the fury of the ocean and St. Guénolé must be one of the most desolate spots on the face of the Earth. As a compensation it can boast the loveliest women and the finest-looking men in the whole of Brittany. They are an exclusive race and dislike marrying outside their village. They live by the sea, for nothing but the eternal gorse and heather will grow.

The southern coast of the province is sheltered from the direct assault of the ocean and so its aspect is more gentle, but not so grand. On this coast we find the naval port of Lorient, the delightful little fishing village of Auray, and at the mouth of the Loire, the modern town of Saint Nazaire. A short way up the

estuary lies Nantes, one of the oldest ports in France. And then come the magnificent stretches of sand of La Baule.

Civilization has developed mainly along the coasts, for in the interior, l'Agoat, the soil is very poor and the population is scattered in distant farms. The climate is much the same as in Ireland and Cornwall, with mild winters and temperate summers, and westerly winds that bring much rain and some fog.

Chateaubriand, who was born at St. Malo, drew the portrait of his compatriots: "Of lively imagination and nevertheless melancholy, of moods as changeable as their character is obstinate, the Bretons are remarkable for their strength of will, their fidelity, their spirit of independence, their devotion to their religion, their love for their country." They have remained faithful to their traditions, and to their religion as the innumerable stone calvaries show. They still speak the Breton tongue in the departments of Finistère, Côtes du Nord and the Morbihan, and many of the men, mostly the older ones it is true, wear the broad-brimmed black felt hats with the large silver buckles that are their traditional headgear. The women are more conservative and in all but the more frequented villages, a girl who abandons the long-sleeved, full-skirted dark dress, the silk apron, usually in a contrasting



THE HARBOUR OF ST. MALO
Photo: French Railways National Tourist Office

colour, and the starched white headdress, is an object of scorn for the other women.

Armor has been called the Land of Pardons. These are pilgrimages to local churches and shrines on which go thousands of people every year. Some take place in the day, some are torchlight processions in which each of the devout carries a taper shaded by waxed paper on which are printed the words of the canticles they sing. Religion is so much a part of the Breton's life that it seems to him quite natural to find all the attractions of the fair grouped round the object of his pilgrimage.

Religion, and also legend and superstition are still very much alive. On the eve of All Souls' Day the family retires early to bed, leaving the table spread and the fire alight, so that the dead, returning that one night in the year, may comfort themselves with food and warmth beneath the roof that once was theirs.

Such is Brittany, Celtic sister of Ireland and of Wales, a land of legend as no other part of France is, home of a seafaring and mystic race.

Normandy. For ever famous for the part it played in the 1939-45 War is Normandy. It falls into two distinct parts: Upper Normandy, the district of Caux, rich farm lands on the low hills bordering the Seine that end in the high cliffs overlooking the English Channel; Lower Normandy, that is partly meadow land with a few poor, scattered houses, partly rich cornland with flourishing villages of solid, well-built stone houses, and Caen, memorable for its grim battle in 1945, as the centre. The meadow land runs down from the Cotentin



CALAIS
The Hotel de Ville
Photo Topical

Peninsula into the Bocage, a region of green wooded hills, known as "Norman Switzerland."

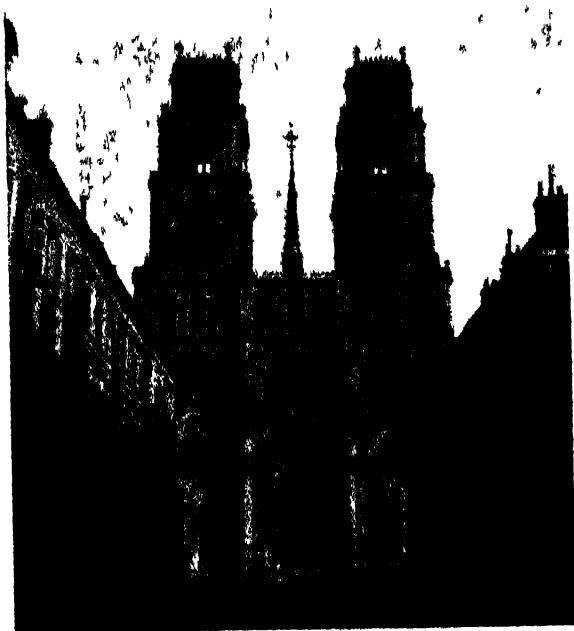
The coast from Dieppe to Cherbourg is a succession of small seaside resorts and so is called the "Norman Riviera." Dieppe is an ancient fishing town that has been the home of many French and English artists and writers; Honfleur has a very old harbour and a strange wooden church; Trouville, Deauville, Houlgate, Cabourg, are all popular in summer. Fine, sandy shores stretch all round the Cotentin and the Norman coast ends at Mont St. Michel, that many people imagine to be in Brittany. This strongly fortified granite rock stands alone in a vast waste of sand over which the incoming tide is said to advance at the speed of galloping horses.

The largest Norman town is the river port of Rouen, on the Seine, a Gothic city that has always been the political and religious capital. Caen is another port, on a canal, and boasts two of the finest Romanesque churches in France. Of the coastal ports, the largest, le Havre, stands at the mouth of the Seine and was built by Francis I in the sixteenth century, while Cherbourg is the home port of the Channel Fleet and a submarine base.

Cattle flourish on the rich pastures and apples grow well in the damp climate, so the Norman farmer is usually well-to-do, especially



BOULOGNE
The medieval gateway of the city, La Porte des Dunes
Photo Topical



ORLÉANS CATHEDRAL
Photo Topical

as he is the most deliberate and prudent of men. Always unwilling to commit himself he is the butt of many sayings, rather like the Yorkshireman. "A Norman never tells more than half the truth, a Gascon double." Descendants of the raiding Northmen, they have lost most of their ancient legends, they are hardworking and tenacious, fond of money; their practical sense is great and they drive a good bargain. The Breton dreams, but the Norman reflects.

Flanders, Artois and Picardy. The three most northerly provinces of France, Flanders, Artois and Picardy, have been invaded since time immemorial, but always the peasant has returned to his heavy soil and has continued his work, the cultivation of corn, flax and hemp and, more recently, sugar beet. Only after the 1914-18 War did he lose hope of being left in peace, and though the works and factories round the coal mines were of necessity rebuilt and production again set going, the corn lands round the Somme lost a large part of their population. The soil in Picardy is not naturally fertile and through countless centuries the Picard peasants have spent their lives cultivating it till it has become rich: but soil soon falls back into its primitive state and after 1918 only the most persevering had courage to take up again the weary toil.

The place names of these provinces are familiar to the English through medieval and

modern history; and many of the places themselves are still recognizable by their ancient buildings, so carefully has the Government had them reconstructed, like the wonderful Town Hall at Arras, from the original plans. Lille, the "Capital of French industry," has still its masterpiece by Vauban, the Citadel that is a miniature city, and Amiens its Gothic cathedral that Ruskin called the "Bible in stone." On the coast is Dunkerque, an old pirate town whose cathedral stands high above the dunes; Calais looks towards Dover, only twenty-one miles away. Due south lies Boulogne. Here both Napoleon and Hitler waited in the hope of attacking England.

Champagne. Champagne lies east of Picardy; in the extreme south there is an arid dusty plain, but the centre is the home of sparkling wine and the people who grow rich from it. It is a well-watered region of many rivers, and flourishing towns stand along their banks. Troyes on the Seine is worth a visit to see its thirteenth century church of St. Urbain and the cathedral of St. Peter and St. Paul. Reims is a double city, part above and part below the earth, and both suffered heavily during the Wars. In the subterranean city, millions of bottles of pale liquid gold lie maturing in the cool chalk cellars; in the sunlight the cathedral again rears its twin towers to the sky: the church of Saint Rémi, which also was bombarded, is the work of artists and craftsmen from the eleventh to the fifteenth centuries. The Ardennes, a barren tableland of melancholy aspect, occupies the extreme northern corner of Champagne.



LA ROCHELLE

The historic port where exiled Huguenots took refuge in the sixteenth century To-day it is a busy centre of French shipping

Photo Keystone



HISTORIC SCENES

Above The medieval fortifications of Carcassonne. *Below* The ruins of the Roman arena at Nîmes, in the Rhône valley

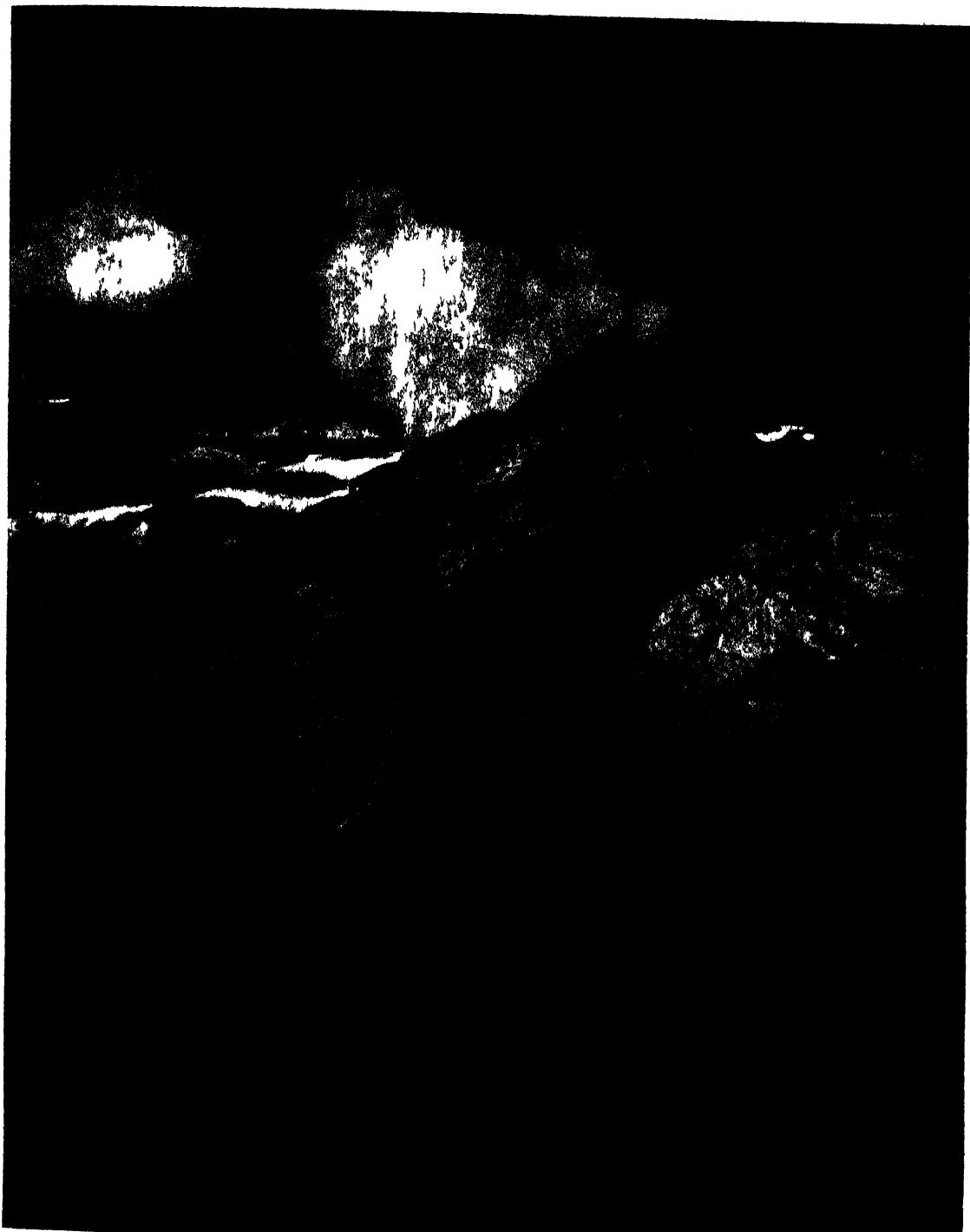
Photos Keystone

Like its neighbours, Champagne has often been a theatre of war, but the vineyards are comparatively easy to replant and the quality of the soil remains excellent for grapes. The people of the wine districts are, not surprisingly, gay, hospitable and open-hearted. In the Ardennes they still believe in wizards and the spells they cast. All over Champagne, at the Feast of the Epiphany, a slice of the

"King's Cake," in which small china figures are hidden, like the silver toys in a plum pudding, is put aside for God, and poor people come begging for it, singing a song of woe.

Ile de France. Between the plains of the north and the plains of the centre lies the heart of the whole country, the Ile de France, almost surrounded by four rivers, like the New Jerusalem. From here sprang the impulse that drew the provinces together and became their power, and that inspired the language and the art of France. The countryside with its rolling hills, its quiet rivers and wide forests under the soft, luminous skies, is smiling, friendly, and harmonious. Ancient forests of splendid timber trees enfold "sunny spots of greenery" such as the race course at Chantilly where the French Derby is run, and stately castles and palaces: St. Germain en Laye, dating from the sixteenth century, with its great terrace; Chantilly, of which a Duc d'Aumale made a present to the Institut de France in 1897; Rambouillet, the summer residence of the President of the French Republic; Fontainebleau, whither Francis I, that urbane king, summoned the Italian artists of the Renaissance, and where Napoleon bade farewell to his veteran guard on his abdication; and Versailles, supreme in its lovely setting of dark trees and shining pools and fountains.

Touraine. The road to the south leads down into the central plains, first into the fertile district of La Beauce through Chartres, where the glorious cathedral contains some of the finest stained glass in the world; to Orléans, sheltered by its grim, enormous forest, saved from the English by Joan of Arc; and so to the River Loire. Along the river banks, and in the province of Touraine through which it flows,



THE CIRQUE DE GAVARNIE IN THE WESTERN PYRÉNÉES

Photo French Railways National Tourist Office

(G. 109)

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stand castles of many different periods, built by kings for their protection or their pleasure. Among them are Amboise, Loches, Chambord, Chenonceaux, Blois, Azay le Rideau, and Chinon, the birthplace of Rabelais, that gives its name to an excellent red wine. Touraine is a peaceful, happy land in which the fishermen along the river banks seem contented and at home.

Anjou. If we follow the Loire downstream we shall find ourselves at Saumur, a most interesting town because of its enormous bridges and mighty

chief city. They are good cultivators, and they have kept alive their traditional dances and customs, one of which is the planting of a hawthorn branch before the home of a betrothed girl. Between Poitiers and the sea lies the district of La Vendée with its varied countryside: le Bocage Vendéen, moors, woods and hedges; the plain where corn grows well, and the marshes, intersected by numberless dykes, and inhabited by blue-bloused peasants whose life has been hardly changed by modern developments, so that they are often shy with strangers and appear



AVIGNON

Aerial view of the famous French town. The broken bridge over the river Rhône is featured in a well-known French nursery rhyme.
Photo H.O.A.C.

walls and the grim fifteenth century castle, from which the town appears blue in colour by reason of its slate roofs. It rivals in interest and charm the capital city of Anjou, which is also on the Loire, fascinating Angers, set in the centre of the province whose delectable rosy wine gladdens the kind hearts of the Angevins, cheerful folk, always mighty men of valour who have not lost their taste for "fighting, fêtes or fanfares."

Anjou lies to the north-west of Touraine; to the east of these two joyful provinces the calm, gentle, contemplative Berrichon tills his fields among the ponds and marshes of the province of le Berry. A melancholy land: it is no wonder that the peasant should believe the wandering will o' the wisps to be the souls of the dead.

Poitou. Turning west again, we enter the province of Poitou, much of it barren heath, and come to its capital city, Poitiers. The people are of Celtic descent and their history is written in the houses and buildings of their

to prefer the company of the ducks they breed.

From Brittany down to the Spanish border the Atlantic coast is bordered with sand that in the extreme south of Gascony forms dunes held together by pine trees that are grown for their resin. This sandy waste is called the Landes. The important ports are La Rochelle, which has not changed since it held out for the Calvinists against the power of the king in the seventeenth century, and south of this the military base of Rochefort.

South of Poitou we find ourselves in the district now called Les Charentes, good agricultural land that produces cereals, vegetables and fruit trees, of which the largest town is Angoulême, encircled by old walls, and the most important, Cognac, centre of the famous distilleries. The climate is extremely mild, both in winter and summer. The Charentais are amiable, hospitable folk with excellent heads for business.



GRENOBLE, THE METROPOLIS OF THE FRENCH ALPS
Photo French Railways National Tourist Office

Gascony. The large province of Gascony is celebrated for its wine and the gaiety and good humour of its people. But wine is not its only interest though it predominates round the eighteenth-century city of Bordeaux, the commercial metropolis of the south-west and an important colonial port. The River Garonne divides the province from south-east to north-west. North-east of it lies the Périgord, with its plateaux and green valleys in one of which stands Périgueux, proud of its curious Romanesque cathedral. South of Périgord we penetrate the strange region of Le Quercy, immense stony stretches, dotted with little clumps of oak and juniper, that have been mined into grottoes and gulls by subterranean streams.

In the north-western corner of Gascony the Médoc hills provide the gentle slopes on which the grapes ripen so well, and south of them is the sandy region of the Landes where gloomy pools lie stagnant among the pine-covered dunes.

The Gascons, who have played an energetic part in French history, are remarkable for their vivacity, which often expresses itself in lively gestures, for their exaggeration, and for their quite exceptional instinct for business.

Tucked away in a corner between the Landes, the Pyrénées and the sea, the French Basques, like their cousins over the Spanish border, have kept their soft, musical language whose origin is as little known as the ancestry of these strange

mountain folk themselves. But they have a strong sense of their individuality, and their national game, pelota, and many of their dances, are peculiar to them.

Béarn. From the terrace of the Castle of Pau, capital of the little province of Béarn, on the southern boundary of Gascony, there is a splendid view of the jagged chain of the Pyrénées that divide France and Spain from Biarritz in the Basque country to Perpignan on the Mediterranean. The central Pyrénées are for the most part high, straight mountains separated by narrow valleys in which stand a long series of spas, among them Luchon, Cauterets and Lourdes. The thickly-wooded mountain slopes are well watered and are starred by tiny pastures of emerald green. The outlines of the eastern Pyrénées are sharper and the mountain sides are more arid under the brilliant sky.

Languedoc. A country of mountains, hills, plains, and strange inland cliffs and gorges, Languedoc is bordered south-east by the Mediterranean; populated by a joyous, gifted, passionate race that seems to have wine as well as blood in its veins, generous as the sunlight that floods the land. Highly developed in Roman times, under the influence of Rome and the East, the civilization of these people flowered again in the Middle Ages. Much of what they created has survived, especially their buildings, which decorate and lend fascination to Toulouse, the capital and well-spring of their art, to Montauban, staunchly Calvinistic, to Albi of the three bridges, city of Milton's "slaughtered saints," to Narbonne where they blend the wines, to Montpellier, a university town since the Middle Ages, to Nîmes, centred round its magnificent arena, and the Temple to Diana, to watery Sète in the middle of the lakes and canals, and to Carcassonne, set on a hill, twice girdled with walls and defended by fifty-two towers of the twelfth and thirteenth centuries. The arenas are still used, for the Languedocians are extremely fond of the art of bull-fighting.

Bounded by Languedoc and the Pyrénées the plain of Roussillon is bordered on the east by the sea. The people here are Catalans, charming and exuberant, and they cultivate olives, figs and corn. Following the coast line to the eastern limit of Languedoc we come to tiny Aigues-Mortes, town, or village rather, of Dead Waters, still narrowly encompassed by its thirteenth century ramparts.

Provence. We are now in the southern part of Provence, la Provence Maritime, where one marvellous city after another lies bathed in

sunlight in the plain. Arles, on the hill round which flow the wide yellow waters of the Rhône, where the Romans sleep in rows in the ghostly Alyscamps, and where the women, when they are animated in conversation, are the loveliest in France; Aix en Provence, Roman Aix, a museum city, very much alive inside its magic circle of plane and almond trees, where water springs, hot or icy, from a thousand fountains; Avignon, dazzling white, where the river flows past the Palace of the Popes and on its bridge the children still dance in rings.

Marseilles, the most important port in France, where they make a soup, *la bouillabaisse*, from more than fifty different Mediterranean fish, is the western limit of the Azure Coast, that paradise of holiday-makers from many parts, which stretches to the Italian frontier. About half way along lies Toulon, the great naval base of the Mediterranean Fleet.

The interior of the province, called La Provence Pierreuse (stony Provence), is a region of formidable rocky chasms carved by the rivers in the Basses or Lower Alps. From the valley of the River Durance, Paris gets its vegetables.

The men of the mountains are tenacious, patient folk; in the easy-going south they are highly imaginative, very generous, and wonderful tellers of tales. The good things of the earth come easily in Provence and the Provençal likes to live and to let live. Time is of no great importance to him. He is for ever inventing new tales, but he has others that are



THE ROMAN ARENA AT ARLES IN PROVENCE

Photo French Railways National Tourist Office

very old. One of them tells of the origin of Saintes-Maries-de-la-Mer, the port that stands in the only desolate corner of sunny Provence, the Camargue, a marshy plain where jet black bulls and snowy horses roam, lying between the two branches of the Rhône. The legend says that Mary Jacoby, sister of the Virgin, and Mary Salome and their black servant Sara reached Camargue by boat and made the place their home. The Gypsies look on Sara as the Patron Saint of their race and every year, in the month of May, great numbers of them gather round her grave: there are religious celebrations, followed by bull fights, processions and traditional dances.

Dauphiné. We have glimpsed the Alps from Provence. In the province of Dauphiné we begin to realize the height and majesty of this tremendous mountain range. There seems no end to the succession of peaks. Grenoble, the capital town with a famous university, lies in a deep bowl over which tower the Belledonne group, and also the group of La Grande Chartreuse, on whose slopes grow the numerous herbs and plants from which the monks of the famous Monastery distil the "divine liquor."

Savoy. It is in Savoy, however, north-east of the Dauphiné, that we are really in the high



ON VNEY RIDGE

The Canadian National War Memorial unveiled by King George V in 1936.

Photo: Keystone

mountains in all their grandeur and beauty. Savoy is one of the most beautiful parts of France. Its famous places, the Lakes Léman, Annecy, le Bourget, the Valley of Chamonix, the mighty Mont Blanc, have an universal appeal. Less known, perhaps, but very lovely, are the wide valleys of La Maurienne, and la Tarentaise which is formed by the River Isère that runs through Grenoble.

At the head of la Tarentaise, the Iseran Pass,



GRÈVE

A village in a Pyrénées valley

Photo: French Railways National Tourist Office

opened in July, 1937, is the highest motoring road in Europe and is surrounded by snowy peaks, that seem almost on a level with the road. In the Tarentaise the women still wear the national headdress, a most becoming circlet of black velvet often covered with gold or silver braid, that is stiffened in front while the rest is tubular and contains their hair. It takes an hour to put on.

The Savoyards are a small, dark, mountaintop race. They appear a little fierce or distant at first, for their country is not rich and their life is always a struggle with the elements and till recently they have been on the defensive against their neighbours. They are wonderful mountaineers and the Chasseurs Alpins form one of the finest and most famous corps in the French army. The feudal spirit at its best still reigns in the less accessible parts of Savoy and the squires in the villages and the officers of the corps regard themselves and are regarded as the fathers of a family.

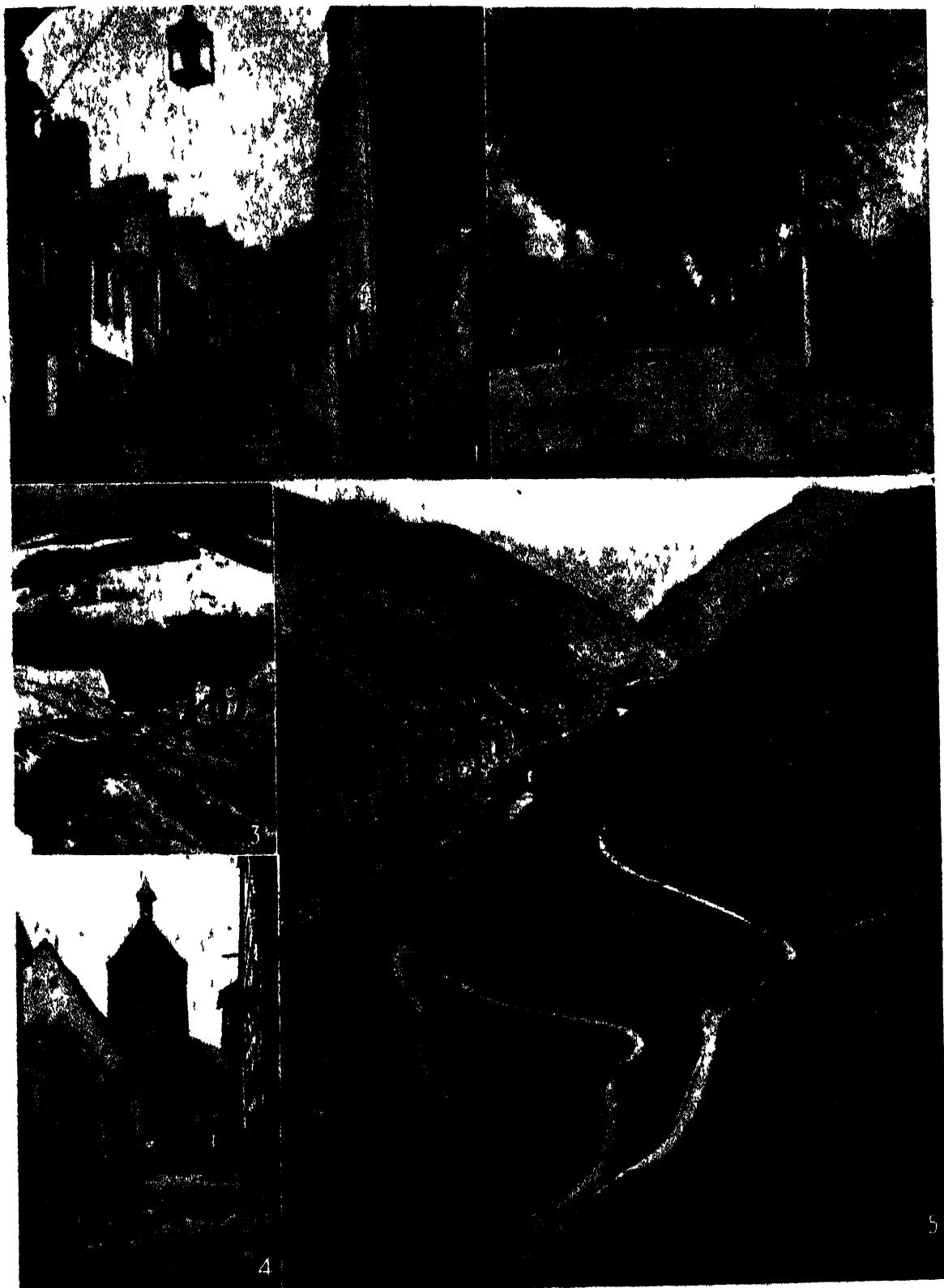
Over the western border of Savoy we are in the Lyonnais. The high mountains are left behind and in the northerly district, the Beaujolais, we find the rounded hills beloved of the vine. To the south the hills are barren. Lyons, the third city of France and the centre of the great silk industry, occupies a very important position where the Rivers Rhône and Saône converge, at the head of valleys extending to the Alps, the Mediterranean and the Rhine.

Auvergne. We are still facing west and before us lies Auvergne, the country of the Massif Central or Central Range, which is largely volcanic in formation. Rich pasture abounds in the south, the district of Le Cantal, but the northern part is wild and savage, with the exception of the smiling plain of Limagne through which the River Allier runs. The highest mountains are the Puy de Sancy, the Mont Dore group, and the Plomb du Cantal. The region abounds in springs of mineral water.

The Auvergnats are descended from the Arvernes, the most heroic soldiers in the army of Vercingetorix that long resisted Julius Caesar. They are hardworking folk, especially out of their own province, which many of them leave for Paris where they often set up as coal merchants or keepers of small cafés. Much the same tales and jokes as the Scots tell against themselves are current about the Auvergnats.

Limousin. The heights of the Massif Central slope down into the province of the Limousin where they break up into hills and plateaux. What is called "the Mountain" is curiously enough a vast moor. The rest of the Limousin is a charming country of meadows, streams, stretches of heather and woods of chestnut trees. Limoges, the capital, is not very interesting. The Limousin is a rather obstinate person and a convinced fatalist. His northern neighbours in the little province of La Marche are very like him. The soil here is poor and the chief industry is the making of wooden sabots.

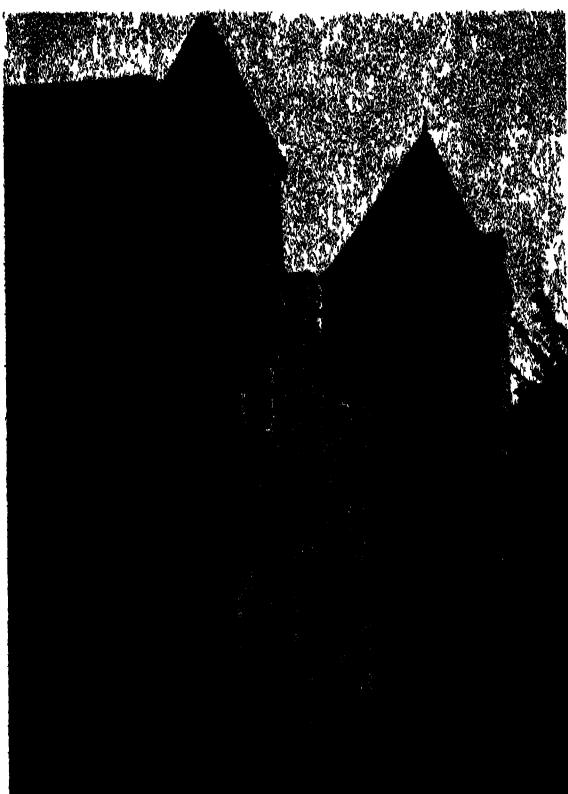
Bourbonnais. The people are very different in the Bourbonnais, that lies north-east of La Marche. The soil is extremely fertile, being well watered by the Rivers Cher and Allier, and Vichy, the famous spa, brings easy wealth to a large number of people. The Bourbonnais are indolent, not easily excited. They love luxury, fine clothes and pleasure. A local saying has it that the babies are born with their feet up and cards in their hands. There are many legends, as is usual where the people are not hard-worked.



THE COUNTRY AND THE VILLAGES

1. Old Cottages in the Rue Jersual, Dinan. 2. Bullock drawing a hay-wagon through an avenue of Burgundy Alps. 4. A village in Alsace. 5. Les Gorges du Tarn, La Malène

Photos: French Railways National Tourist Office, Fax; Wide World



CASTLE FARM ON THE CHER
The moated castle of Burlesure
Photo: Charles Mougne

The northern promontory of the Massif Central runs up the eastern boundary of the province called Le Nivernais of which it is the most important part. Its name, le Morvan, a Celtic word, means the Black Mountain. The Nivernais breed very famous cows. They cultivate the vine, and many of them are woodcutters and live isolated in the forests. They wear black blouses and large felt hats. Superstition is strong among them and some of the old men still practise sorcery.

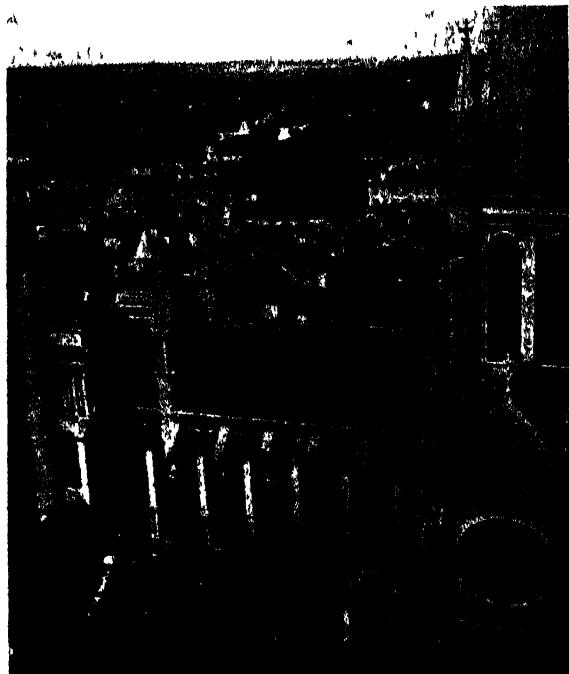
Burgundy. Burgundy is an ancient dukedom that comprises several territories, among them the basins of the River Saône and the River Seine, where the Germanic tribe called Burgondes settled in the fifth century. West of the Saône, there are chalk tablelands, the sides of which are called "côtes." On these grow the grapes from which the historic wine is made. They are called the Côtes d'Or, the Golden Slopes. The road from Mâcon, in the country beloved of the poet Lamartine, to the capital city, Dijon, is flat between the côtes and at intervals along it rough tracks leading to the slopes are marked by wooden signs that bear the enchanted names of Volnay, Vosne-

Romanée, Romanée-Conti, Corton, Clos Vougeot, Chambertin, Pommard, Beaune. Dijon is a fine city and bears many witnesses in stone to the pride and grandeur of its past.

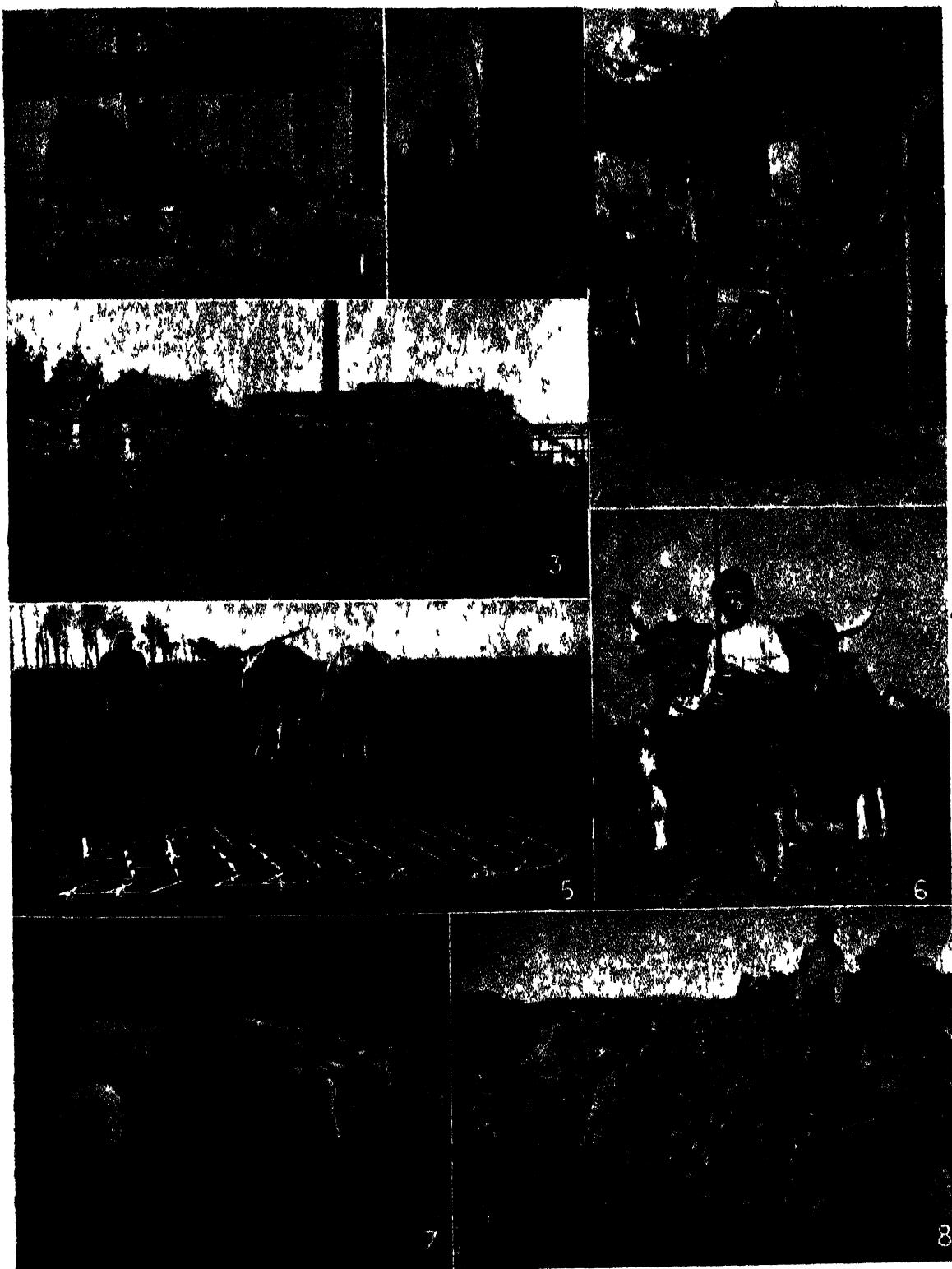
To the north-west of Dijon the lovely old town of Avallon looks out over the smiling Avallonnais valleys and hills, one of which is crowned by the little village of Vézelay and the magnificent Romanesque Basilica of St. Madeleine that dominates the whole of the countryside.

The broad, swiftly-flowing River Yonne runs through a fertile district and past the ancient city of Auxerre, where it mirrors on its surface the splendid Gothic cathedral and the old Roman abbey of St. Germain, which tower above huddled old houses and narrow twisting streets. Near Auxerre, the white wine of Chablis is made. Michelet, writing of the wine district of Burgundy, called it "a good country, where the towns put vine branches on their coats of arms, where everyone is 'brother' or 'cousin,' a country of good trenchermen and joyous Christmases."

Franche Comté, to the east of Burgundy, shows us different ground, a different sky, another world. The Jura mountains, which in the centre are tablelands, rise between the Swiss plain and the plain of the Saône. Victor Hugo was born in the capital, Besançon, and



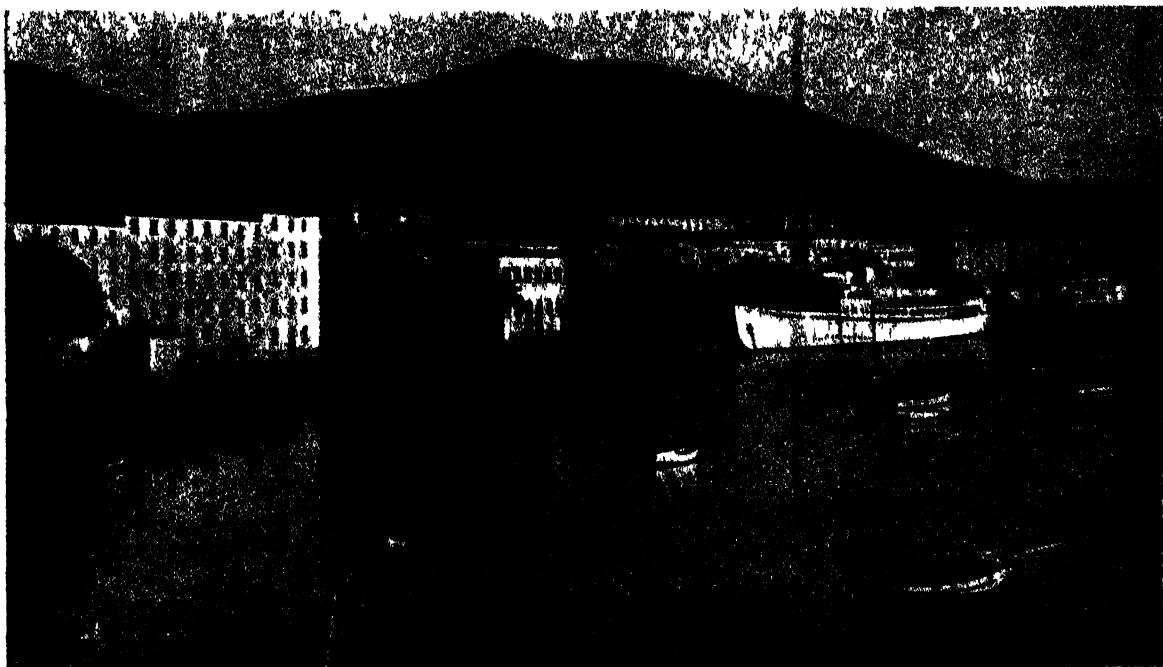
DIJON, THE OLD CAPITAL OF BURGUNDY
Photo: French Railways National Tourist Office



SCENES OF RURAL LIFE

1. A peasant goes to town, Cosee. 2. Sharpening a scythe. 3. Unloading sugar beet outside a sugar factory. 4. Stalls at the Marseilles fish market. 5. Oxen drawing the hoe across a vast ploughed field in northern France. 6. A Basque peasant boy. 7. Draught oxen in the Morvan district. 8. A vineyard of Provence

Photos Charles Mougin, Plant; French Railways National Tourist Office, Wide World



CORSICA THE PORT OF AJACCIO

Photo Topical

he described it truthfully as an old Spanish town. Franche Comté was for a long time under Spanish domination and its independent, mountain people are descended from Spanish Moors whose physical type is still often seen in the province.

Alsace. North of Franche Comté are the Vosges Mountains, covered with forests for the most part, though near their summits there is excellent pastureland called "chaumes." They divide the plateau of Lorraine from the fertile plain of Alsace, "Daughter of the Rhine." This rich province spreads from the mountains to the river banks on which stands Strasbourg dominated by its mighty cathedral. The Alsatians have kept, through all their vicissitudes, their good humour, their steadfast character, their carping spirit, and their love of music, songs, dancing, and rich food, of which they have created a supreme triumph, their pâté de foie gras.

Two main rivers, the Meuse and the Moselle, flow through Lorraine between calm, austere valleys. Between the rivers rises the fertile plateau that is often called "the Lorraine granary." Nancy, the capital, is a beautiful eighteenth-century city and has a wonderful square, the Place Stanislas, that Maurice

Barrès called "truly royal." The people are quiet, practical, reflective, passionately attached to their country, the possession of which has been disputed through the ages by France and Germany.

Corsica. Corsica, which lies in the Mediterranean off the south coast of France, is a "mountain in the sea," with two climates, Mediterranean and Alpine. Round the coast bloom oranges and lemons while over the mountain sides stretches a forest of oaks, beeches, and pines. A large part of the island is covered with the "maquis," a waste of brushwood. There were bandits in Corsica not so very long ago and they found good cover in the mountain fastnesses.

Napoleon Bonaparte was born in the charming little port of Ajaccio. The Corsicans are a warlike people, Italian in character. They fought fiercely for their independence, retreating to the mountain where they held out for a long time, before they were finally subdued. The island became part of France in 1768. The islanders live mainly by breeding sheep and goats. They have long memories, particularly for family quarrels, and they still live in a patriarchal fashion, in their "Isle of Beauty."

The Wealth of France

FRANCE has always been remarkable for her varied wealth. Her wide range of physical features—from rugged Alps to fertile plain; from rocky shore to the Côte d'Azur—and her variety of human types give the greatest resources of any country in Europe. But France has fallen upon hard times and her difficulties are immense. The 1914-18 War left her with the task of restoring ravished Flanders, modernizing her machinery and concentrating her industries; the 1939-45 War left her with graver and more widespread difficulties. Industries, factories, towns, roads and railways and agricultural land were destroyed from Flanders to Toulon. Labour, political and economic crises followed each other in quick succession. Yet discouragement and difficulty do not impair the confidence of the French people in the natural wealth of their country, or in their aptitude to work it.

This survey will endeavour to portray France in her normal state despite the somewhat unstable conditions which have prevailed since 1945, and for this purpose it will sometimes be necessary to refer back to the period before the war. On no account should post-war problems allow one to forget the traditional characteristics of French economy which endure because of their relation to the natural conditions of the soil. France is favoured by the variety of her agricultural resources, by her position at the west of Europe with three seas to bathe her coasts, and by her industrious population.

Agriculture. Despite the progress of industry, agriculture has retained its very great importance. The latest statistics show that, though not more than 37 per cent of the population is occupied in agriculture, nearly a half still lives in the country or in small towns which are essentially agricultural markets, and a great number of townspeople have kept a few patches of ground.

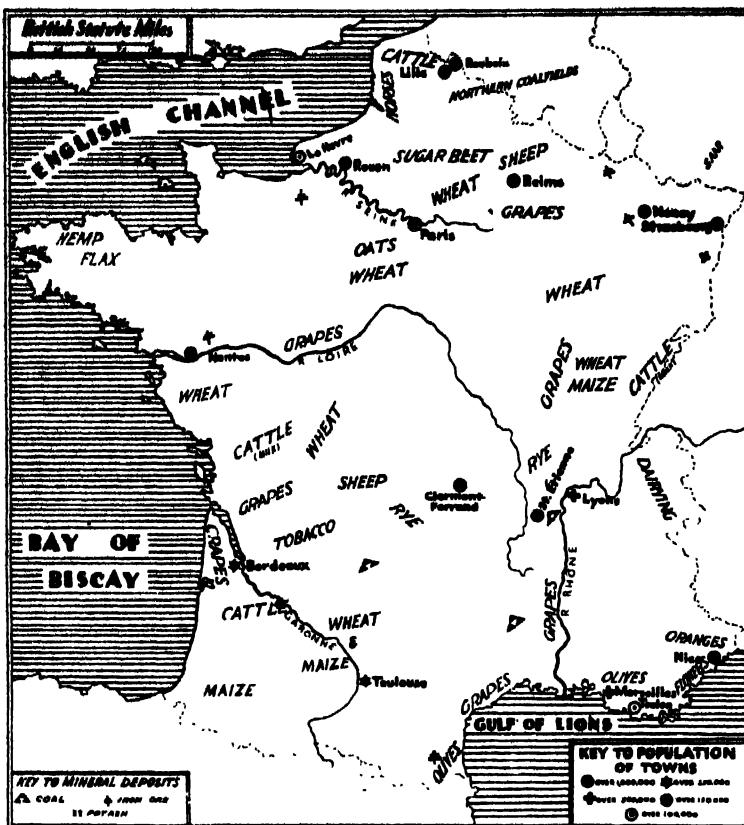
The value of the annual wheat-harvest is greater than that of the output from the metallurgical industries, and the automobile industry's output equals in value the barley-harvest. In general it may be said that agriculture remains a long way the first of French industries. Admittedly the agricultural population does not include more than 7,500,000 people and it had decreased considerably

between the wars. "Rural depopulation," consequent upon the movement towards the towns, is one of the most serious social problems to be solved in France. It is affecting above all the class who own or farm a small area of less than two and a half acres. But two-thirds of agricultural land is still divided into holdings of less than twenty-five acres and 98 per cent of the agricultural population works there whilst only one-third of the land belongs to big landowners.

The area of uncultivated land (14,212,500 acres) increased by nearly 5,000,000 acres after the first war. But, if the less fertile land has been abandoned, the return from the rest has been improved. There are interesting changes in the apportionment of cultivated land. While the extent of vineyards (4,000,000 acres) has scarcely changed, that of arable (52,000,000 acres) has diminished, and that of pasturage and meadow (31,000,000 acres), and of market gardens (900,000 acres), is increasing.

The French farmer is occupied less in tillage, but more in stock-raising; though the numbers of sheep (grazing on the least fertile land) are much lower, the figures for cattle have been well maintained and they exceeded 16,000,000 head in 1951. This change shows the effort that agriculture has made to adjust itself to an insufficient number of workers. But it also reveals a fact characteristic of the standard of life attained by the French who are consuming more wheat and vegetables and less bread.

Modernization of Farming. Nevertheless the French peasant remains largely a small landowner, hard-working, eager for gain, and still keeping, for all the trend towards the towns, that love of the land by which he lives. Efforts have been made to obtain some modernization in his unremitting toil, some improvement in his methods and his instruments of labour. The work of education, undertaken by the State, has not yet been carried in France to the same lengths as in other agricultural countries. The agricultural schools and teachers to be found in every division of the country have not enough influence as yet. After the first World War the State made a great effort to develop agricultural credit; after the second it has set out to modernize agricultural machinery, under the "Monnet Plan." Trades Unionism has also been making steady progress.



There are in existence more than 14,000 agricultural co-operative organizations—1700 cheese factories, 450 dairies, 1200 corn-selling concerns, and 1800 threshing houses. The National Union of Peasants Societies, the most important of the trade-union federations, embraces about 10,000 societies and 1,200,000 peasant families.

The greater the subdivision of land the more it is necessary for the French agricultural workers to form associations. Added to the excessive number of small landowners is the fact that the land they work often does not form one piece, but is dispersed over separate fields. A rearrangement of the map, a "unification," is suggested. In some of the regions ravaged by war exceptional circumstances have allowed this to take place; elsewhere it is easy to imagine how difficult it is to accomplish the change with peasants attached to their land, and no rapid progress is to be expected.

Improvement in methods of cultivation was, in 1939, already reflected in a considerable increase of returns. The average production per acre was thirty-eight bushels of wine, thirteen hundredweights of barley, and fourteen hundredweights of wheat. If this last figure is

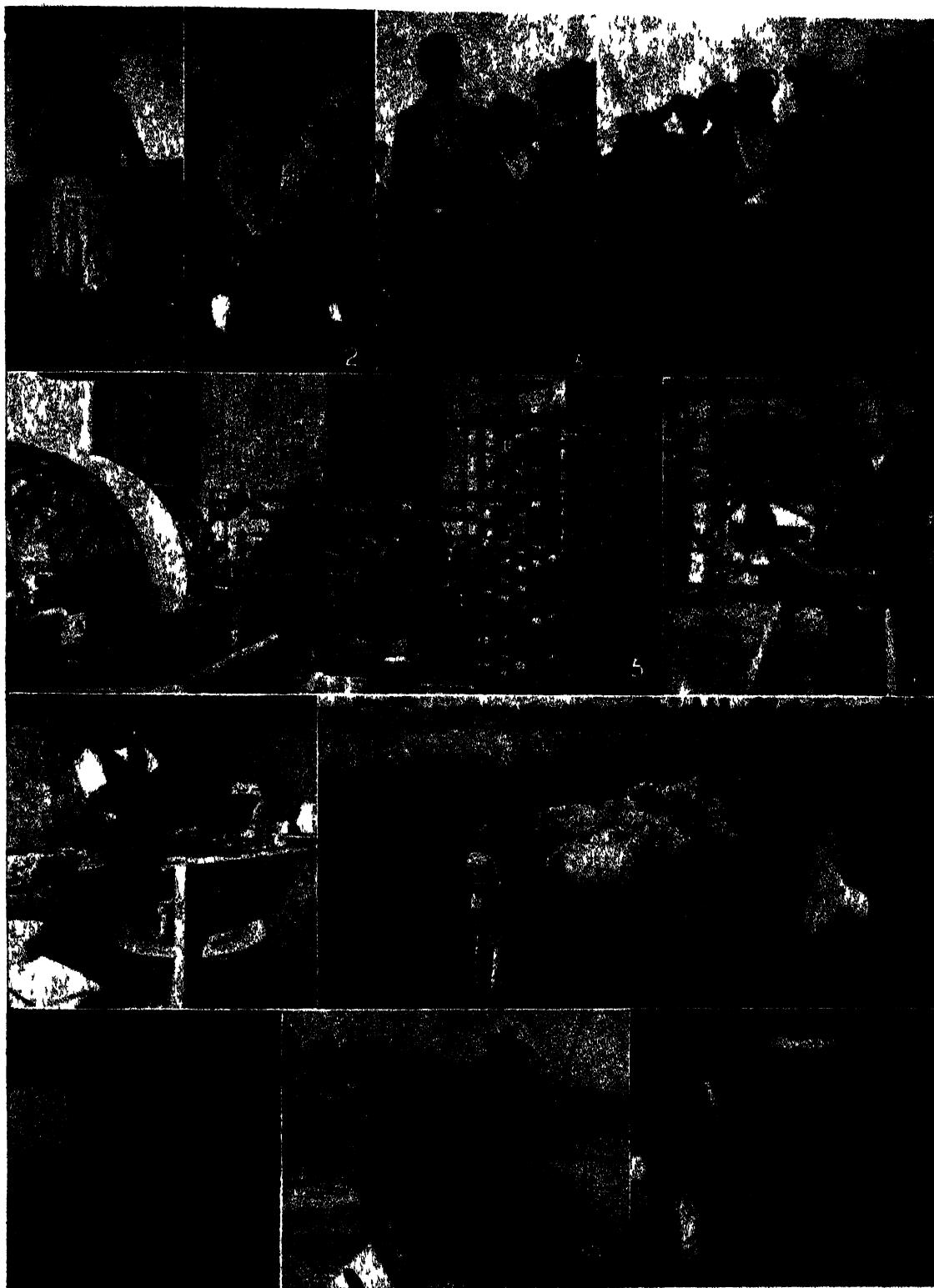
lower than that for England, it is chiefly because the average drops on account of the comparatively poor lands included in the French arable workings. It is, however, almost double the American or Romanian averages. The "Monnet Plan" of 1947 aimed at still further increasing the production of wheat from a smaller acreage.

The essential characteristic of French agriculture is its variety. This followed first from the varied climate of a country that stretches from the Mediterranean to the North Sea, a country of the vine and the hop, of wine, and beer, where in the north grow firs and oaks, and beeches, in the south the cork-oak and the evergreen pine. Furthermore variety comes from a varied soil. Even that most solid of mountain blocks, the Massif Central, is cut up by the rich, warm, alluvial plains of

Limagne and Forez.

The variety of regions is most apparent in that widest plain of all, the Paris basin. An intensive cultivation of beet and cereals spreads over the open chalky plateaux of Artois, Picardy, East Normandy, and the Soissons area. But this changes as the chalk disappears and greater moisture brings dairy meadows and crowded market-gardens in the still moister valleys of the Somme or Aisne. Farther south there is the classic contrast between the two principal Parisian granaries: on the one hand there is the monotonous Beauce plain covered with cornfields, where the dryness of the soil prevents towns from growing up and forces farmers to group together in villages round a deep and expensive communal well; on the other hand is the Brie, furnishing important supplies of cereals, where, at the same time, the presence of light clay gives the right conditions for producing the well-known cheeses, and where the peasants live in dispersed farms and little agricultural market towns rise up in the heart of the country.

Wine-making. Finally there is the connection between the traditions of the people and the variety of agriculture. There is nothing



COSTUMES AND INDUSTRIES OF RURAL FRANCE

1 & 2. A Breton peasant and a lady of Boulogne in traditional costume. 3 & 4. Costumes of Savoy. 5 & 6. Village weavers of Picardy; winding spools for the wool, and winding bobbins for the warp. 7. A potter's wheel. 8. The white horses of Camargue. 9. Monsieur le Curé. 10. Dredging scene from the River Loire. 11. Market porters

Photos: Clive Holland; Charles Mougau; Wide World; Photopress; French Railways National Tourist Office; Topical; Sport and General

more characteristic in this regard than the example of the famous wine-bearing districts of Bordeaux, Burgundy, and Champagne. All three have been vineyards since the time of the Roman conquest and from the twelfth century the wines of Bordeaux have won the favour of the English and those of Burgundy have appeared at the French King's table. The Bordeaux vineyards of 335,000 acres produce over 12,000,000 bushels of wine—sixty-two types of red and twenty-two of white—which owes its value to the aristocracy of Bordeaux wine merchants and to that other aristocracy of cultivators in the neighbouring villages who do not hesitate in the really famous vineyards to gather in the grapes one by one as they ripen. And it is with the same care and reverence that over the 125 miles of Burgundian vineyards, especially the celebrated Côte des Nuits, the workers of to-day continue the traditions of the monks who planted the Chambertin and the Clos Vougeot vines. Since the Benedictine monk, Don Pérignon, in Louis XIV's reign, discovered the secret of making champagne into a sparkling wine, there have been in those well-known Reims cellars veritable artists making skilful mixtures, delicately bottling their wine, sealing up the innumerable bottles, then turning them on their sides and gradually raising them, stacked in vast "libraries."

To-day it is true that the French peasant has a hard struggle between the competition of foreign countries and that of "colonial" pro-

ducts. He also complains, and with reason, of the competition of industry, all the more dangerous with the application of social laws, inadaptable to agricultural life and work, which now tend to increase the attraction of the forces drawing men to the towns. However, since the 1939-45 War it has been realized that agriculture as well as industry has a vital part to play in the national reconstruction. With her external assets gone, France had to produce more food than in 1939, yet her equipment was antiquated and much of her land laid waste.

Industry. For a long while it was less the quantity than the quality of its productions that characterized French industry, and the workmen and small employers alike sought to improve this by their inventiveness and good taste. That this characteristic has been preserved is shown by the fact that many of the workers are still found in small establishments employing less than 100 men. Nevertheless, France before the war was becoming a great industrial country. To know what success may be achieved in this field we must take into account the present difficulties, for, although she was developing in 1939, France was still behind other nations and the war hindered her still more. First, it should be considered what resources France has at her disposal.

As opposed to England and Germany there is a lack of coal. The output of the French coal-fields, which fell in 1936 to 46,000,000 tons, was insufficient even in 1930, when it was



CONTRAST IN COASTAL TOWNS

Left: Brest

Right: Biarritz

Photos: Planck, French Railways National Tourist Office



INDUSTRIAL ROUEN

Photo: French Railways National Tourist Office

54,000,000 tons. By 1950 output had reached only 52,000,000 tons, and to meet the demands of the home market it was necessary to import nearly half as much again.

It is only in the northern district that there are any considerable coal-fields, where the rich seams of Germany and Belgium continue; and these serve for the needs of the Paris area. The coal has given rise to large industrial developments; on the one hand in the heavy industries and in engineering, on the other hand in the weaving and spinning industries, which date from the Middle Ages, and which, with the cotton-trade, have much expanded. The crowded population of French Flanders, with over 500,000 people collected around Lille, presents all the conditions requisite for modern industry—an active working-class, an energetic and enterprising class of employers, and modern equipment installed between the wars, together with a system of roads, railways, and canals connecting it with the port of Dunkerque and the Paris area.

Hydro-electric Power. France has vast resources in "white coal," that is to say in electric power. These are already drawn upon to a considerable extent, but new developments in the Rhône valley will increase generating capacity by 2,000,000 kilowatts. About 2500 miles of railway line, a tenth of the total, are electrified. In various districts, as at Grenoble, large new industries have sprung up. Before the war, powerful generating stations were

built as at the Krembs barrage on the Rhine, and above all at La Truyère, in the Massif Central. Held back by a huge dam 445 feet high and 230 feet wide, the stream is first directed through one generator, then pours down a deep shaft to feed another installed in an immense cave 1000 feet under the ground. The present Rhône plan envisages the eventual construction of twenty hydro-electric stations along the whole length of the river.

Minerals. French industry is much favoured by the country's wealth in iron-ores. Before the 1939-45 War France's production, averaging some 40,000,000 tons, was the greatest in Europe, far ahead of Great Britain (13,000,000) and Sweden (11,000,000). In a politically stable Europe, production would be even more developed. Normally the home demand is well satisfied and much ore is available for exchange with essential coal from the Rhineland.

Nine-tenths of French iron is produced in Lorraine. This is a great development and is quite recent, for it was only at the end of the last century that dephosphorizing processes enabled the minerals to be used. Since then a powerful industry has grown up around Thionville and Nancy which both works the mines and produces cast-iron.

For the production of steel, machinery, wrought-iron, and specialized metalwork the cost of transporting raw material is less important. And so these industries have been established where coal was available in the

north or in Burgundy, or even around Paris. The automobile factories (Renault and Citroën) have also been placed near Paris. In this respect the work of a few enterprising employers has been remarkable. Take, for example, the Renault works at Billancourt, which in 1900 were nothing but a poor hut and to-day employ many thousands of workpeople. There is a



REIMS CATHEDRAL FLOODLIT

One of the most spectacular examples of Gothic architecture in France, dating from the fourteenth century

Photo Fox

complete system of production covering every stage, from the entry of the raw material to the last phase, where in one operation the finished pieces are assembled and a continuous stream of fully-equipped cars comes out into the little island of Ségur in the Seine.

Textiles. The textile industries are amongst the oldest in France. Flax and wool have been worked there since the Middle Ages, and it was in those districts which possessed plant and a tradition of skilled labour that the cotton industry was established. This latter was the first in France to assume (at Mulhouse) the form of a great modern industry. To-day the

principal textile centres are in the north (Roubaix-Tourcoing), on both sides of the Vosges, in Alsace and in Lorraine, in Normandy (Rouen, Elbeuf) and in Champagne, whilst Lyons is the centre for silk.

In the years of depression (the late 1930s) this industry suffered the most, exporting almost nothing and confined within the limits of the internal and colonial market. It was forced to adapt itself to the changing fashions of the hour, and the decline in raw silk production was fortunately matched by a rapidly-growing output of artificial silk. Working by hand with his family or a few apprentices, the domestic silk weaver almost disappeared, and with him one of the most characteristic types of French workmen. He has been displaced by electro-mechanical methods of production, adopted not only for silk but also for rayon. These have given birth to a new industry concentrated in a few factories which made rapid progress in spite of difficulties. The output of rayon staple fibre increased sevenfold between 1938 and 1950.

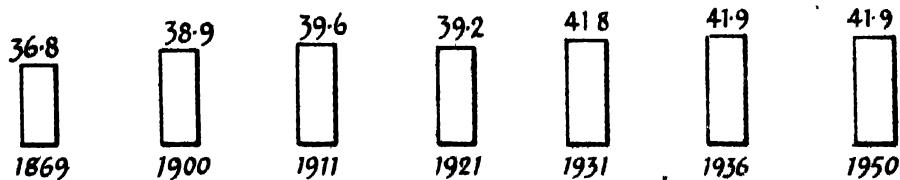
In cotton, with 8,000,000 spindles, France remains a long way behind Great Britain and America, at about the same level as Germany. On the other hand, her production of woollen textiles compares favourably with that of England and America.

But if the textile industries have been much enlarged they still owe a great deal to the special quality of their products. At Cambrai and Valenciennes the workers produce fine handkerchiefs, baptiste and lace; in Champagne they tend delicate machinery for knitting stockings, gloves and caps; in the Vosges, embroidery; the silk and velvet workers of Lyons exert all their care and inventiveness to keep abreast of the ever changing demands of the luxury clothing markets of Paris and the world.

The capital is, of course, the most important industrial region, both from the variety and the intensity of its activities. There are in the suburbs, together with the motor industry and all the engineering trades, sugar and paper manufactures, breweries, and furniture works. In the town itself are produced all those luxury goods that come under the heading of "Paris made," jewellery, glass-ware, furniture, books, and above all clothes. More than 300,000 workpeople are employed in the Paris dress-making trade, of which the world-wide exports reach a value of milliards of francs. The remarkable development of Greater Paris

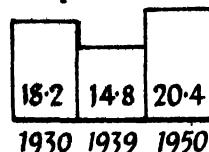
FRANCE

POPULATION *in millions*

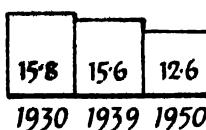


VITAL STATISTICS

Births
per 1000

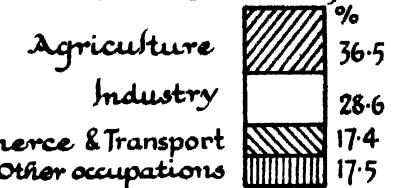


Deaths
per 1000



OCCUPATIONAL DISTRIBUTION

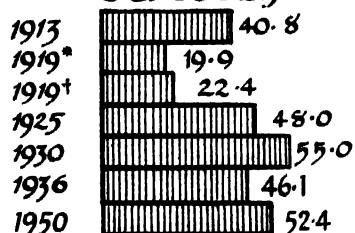
*in percentages of total number
of persons gainfully employed*



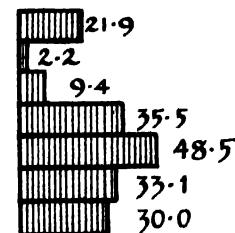
MINERAL & INDUSTRIAL PRODUCTION

in millions of metric tons

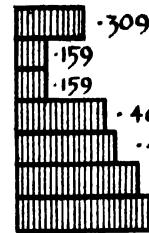
COAL & Lignite



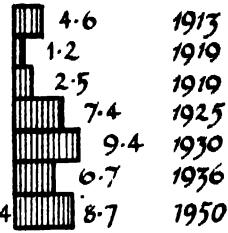
IRON ORE



BAUXITE



STEEL

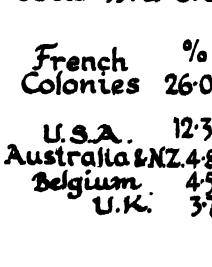


* Old Territory † New Territory

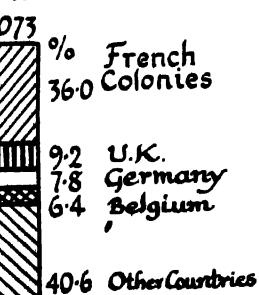
IMPORTS & EXPORTS

Foreign Trade by Countries in
thousands of millions of Francs

Total IMPORTS



EXPORTS

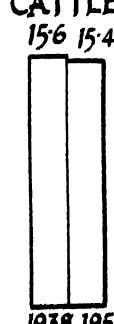


NATIONAL INCOME

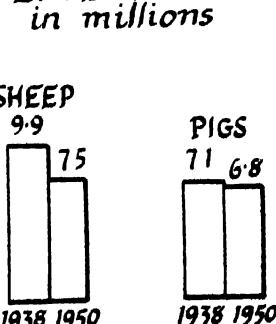
in thousands of millions of Francs

7.395

CATTLE



LIVESTOCK



between the wars raised numerous complex problems of administration and town-planning which have been too slowly tackled.

The last twenty years have been characterized by the undertaking of public works on a scale much larger than before. The trade which used to flow through numerous indifferent ports is now concentrated on a smaller number which have been adapted to the needs of

of the carrying-trade for colonial products, Marseilles has been able to defend itself against competition in the Eastern and North African trades.

Trade. Before the 1939-45 War the figures for French trade rose to 24,000,000,000 gold francs, or about half those for England; 13,500,000,000 of imports were made up of 50 per cent of raw materials, 20 per cent



THE MARKET PLACE OF ST. GAUDENS
The scene of the most famous cattle market in France

Photo Keystone

modern navigation. For example, Rouen, at the tidal limit of the Seine, serves as the port for Paris, as an outlet for the industries of the district at the principal connecting point of the two parts of Normandy. By the construction of a series of new docks in the Seine estuary Le Havre has been made into a national port connected with America. A similar construction of deep marine docks has been completed in Marseilles, and at the same time the great canal, partly underground, has been completed that joins the port to the River Rhône. In this way and by the development

foodstuffs, 17 per cent of manufactured goods, 13 per cent of gold and silver; 10,500,000,000 of exports were divided between 67 per cent of manufactured goods, 20 per cent of raw materials, and 13 per cent of foodstuffs, which may be taken as a normal apportionment. For its industrial needs France had to import coal, petrol, wool, and cotton, while foodstuffs were obtained from the colonies. On the other hand there were exports of manufactured goods, iron ore, and foodstuffs—wine, butter, cheese, vegetables and fruit. In 1936 the total trade figures were only 41,000,000,000 francs

devalued to a fifth of their gold value. But this dangerous fall may be regarded as an exceptional phenomenon of the crisis of that time.

As a rule the balance of trade showed a considerable surplus of imports over exports. After the 1914-18 War this was progressively reduced until in 1926 and 1927 there was even a surplus of exports, though the trade deficit started again in 1928. Against this deficit, of course, there could be set off the invisible exports which France, as Great Britain, possessed. An important income was obtained not only from the tourist trade but from capital invested abroad.

With the effect of the crisis of the 1930s, the deficit had reached the dangerous proportion of 10,000,000,000 out of a total trade of 41,000,000,000. There were very few countries with which France had a favourable trade balance: Great Britain, Switzerland, and Belgium. With the United States of America and Germany there were large deficits.

France sought to compensate for the fall in foreign trade by the development of that with the colonies, and in this respect there had been considerable progress before 1939. In 1937, out of the total of 41,000,000,000, colonial trade accounted for 13,000,000,000, and the colonies absorbed more than half the total French exports. In 1939 the trade with Algeria



MARSEILLES
The transporter bridge in the port
Photo: French Railways National Tourist Office

(imports 2,839,000,000, exports 2,690,000,000) was more important than that with any foreign country.

During this same period a rigid protectionist régime was introduced (as was the case with other countries), and France may indeed claim to have invented the system of import quotas. As a net result relations with Germany were the subject of continuous difficult and vital negotiations, and even with Great Britain a satisfactory general accord was never really attained. But a favourable agreement was reached with the United States of America. The years before 1939 saw a reduction in quota restrictions but it was clear that agriculture and most industries could not do without a high tariff wall.

Following the destruction of stocks and the general dislocation of her economy during the 1939-45 War, France's trading position was desperate, and despite flashes of improvement periodically since the situation remains extremely difficult.

Finance. According to estimates, which are debatable, the French national income is about 50-60 per cent that of Great Britain. But the distribution of this income between the people is not at all the same in the two countries. There is, proportionately, in France a much greater number of



LE PONT DU GARD
The famous Roman aqueduct near Remoulins built to the order of Agrippa, son-in-law of Augustus
Photo: Topical

small incomes and a much smaller number of very wealthy people. Income tax and estate-duty figures show that there are in France only a tenth of the number of people in England who have incomes of over £2000 per annum.

After the 1939 War the deficit of the budget was 48 per cent but was steadily reduced. A drastic financial policy begun in 1947 aimed at completely balancing the budget. Rationing and taxation were the keynotes of this, although by cutting government expenditure and carrying out widespread financial reforms, income tax itself was unlikely to be raised. Loans and credits were not to be used except for reconstruction; exports were developed; production increased swiftly; claims were made for help under the Marshall Plan, and widespread modernization of the entire country (the Monnet Plan) was undertaken. The 1948

budget planned to raise 690,000,000,000 francs as against 50,000,000,000 francs before the war. France had started her biggest financial reform. By 1950 there was every indication that production had again reached its 1939 level, and in 1952 an ambitious second Monnet Plan was formulated to cover the period 1953-8.

It may be said then that the economic situation in France, though difficult, is being courageously tackled. The country has certainly kept those qualities which formerly brought about the development of its agriculture and of its traditional industries. At the same time the necessary equipment for modern industry has been created. And finally, the French people, despite all political difficulties, have not lost that aptitude for work and saving which has been in the past the base of their power and of their wealth.

Paris and Other Cities

PARIS reaps the advantage that always accrues from being situated on the banks of a great river, which explains in part both its historic and its scenic eminence. The fact that the ground rises on both sides, to the heights of Montparnasse on the left and Montmartre on the right bank, adds materially to the city's charm.

It is to-day intellectually, politically and commercially, one of the greatest cities in the world, with a population estimated to approach the 3,000,000 mark, and an area of more than thirty square miles. Population density varies enormously in different parts, ranging from 70-200 persons to the hectare (about 2½ acres) in the well-to-do residential quarters, to 800-1000 persons per hectare in the industrial quarters.

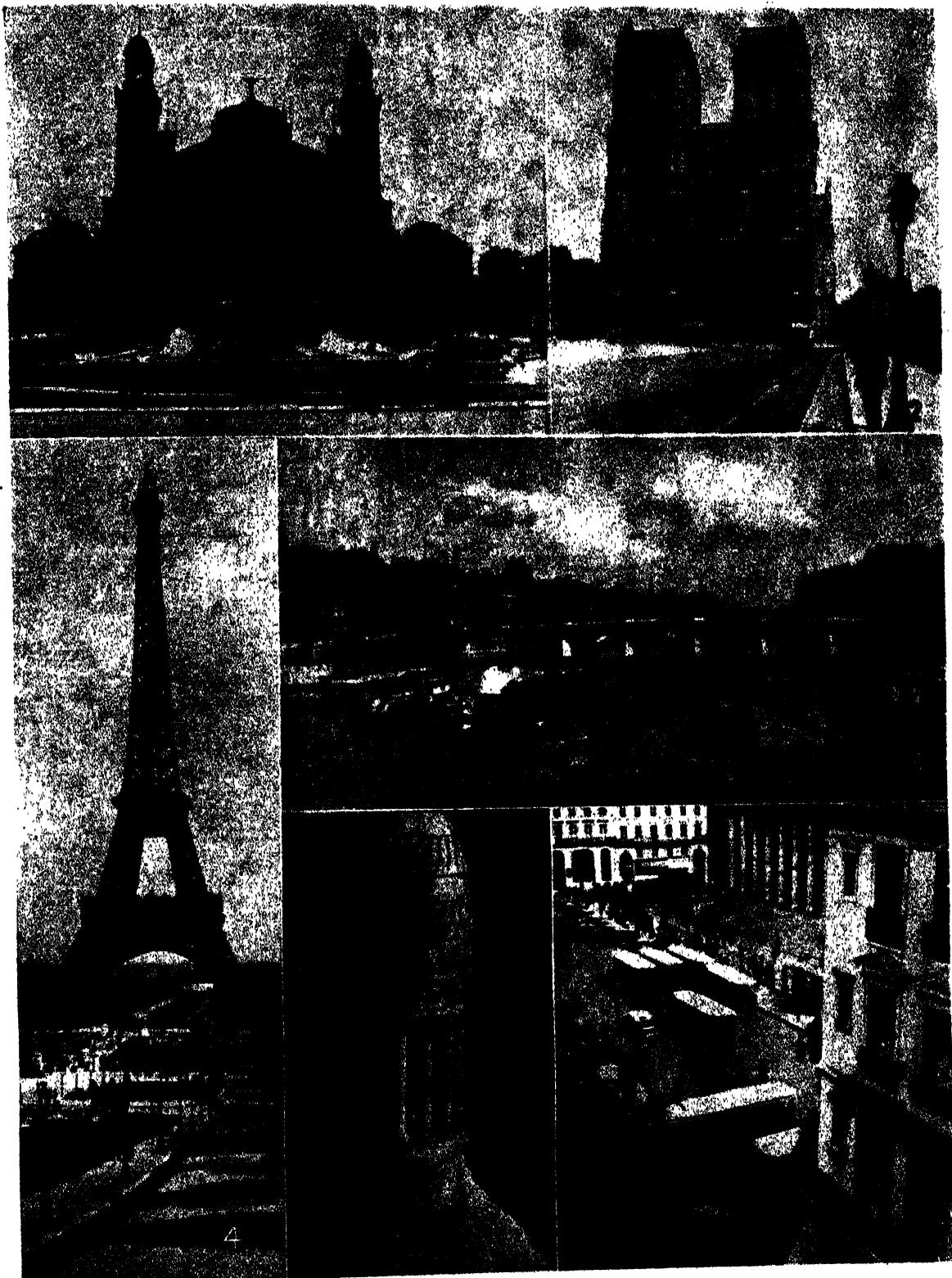
The river flows through the city's heart: trees line the main thoroughfares, which, though humming with life, by reason of their width in many portions of the city, suffer little or none of the congestion which afflicts many of the main arteries of London. The visitor gains an impression not of a great commercial and business centre, but rather of a city glorying in its well-ordered plan and beauty of situation.

Although in a sense very modern, and year by year—nay almost month by month—becoming more so, there are interesting sur-

vivals and many historic buildings and places remaining; up on Montmartre—though here also great changes are taking place—and in the tangle of narrow streets on the left bank, in the vicinity of the Chambre des Députés and Institut de France, one can discover ancient by-ways, and some quaint, old-time buildings.

To know Paris one should devote time to exploration of the greater and lesser boulevards. If one does, one is sure to see much of abiding charm and interest that most visitors miss. In the process also one gets to know something of Parisians of all classes; the wonderfully varied types peculiar to the capital of France. Dainty Parisiennes, who look as though they had just stepped out from somewhere where not a fold of their garments could go astray; little *midinettes* (the cheerful work girls who add a note of gaiety to the streets and boulevards), often in their lunch hour taking their frugal meal on the seats of the boulevards, in the gardens of the Tuileries or of the Luxembourg, or strolling along the *quais* peering into the book boxes lining the parapets, which are such a feature of the outdoor life and an attraction to those in search of book bargains.

There is the smartly dressed *boulevardier* or gentleman of leisure, the prosperous merchant, and workmen of many types. There are, too, the street merchants, a distinct class by themselves, who sell bootlaces and combs; toy



PARIS

1. The old Trocadéro. 2. The Cathedral of Notre Dame. 3. The Seine. 4. The Eiffel Tower. 5. The Dome of the Church of the Sacred Heart, Montmartre. 6. Place de la Bourse, with the classical columns of the Stock Exchange in the background

Photos: Clive Holland; Central; French Railways National Tourist Office; Fox

balloons and paper windmills for the children; sponges and toilet soap; laces, cottons and needles; postcards and newspapers; flowers and vegetables, from perambulating barrows.

In the vicinity of the markets large and small—where one learns so much of a city's life—one meets with many other interesting types, not exactly paralleled in any other city. In the early morning markets are beautiful flowers and plants, and the people who have come in from the surrounding countryside to sell their produce. One must rise before the dawn to make acquaintance with them. There are outdoor markets, too, for birds, horses, and for such odds and ends as pictures, furniture and the thousand and one items that are the city's flotsam and jetsam.

A long morning spent in the Quartier Latin on the left bank, reached by the long, steeply-climbing and historic Boul' Mich', will not fail to interest. One is now in the region of the Ecole des Beaux Arts, and of the *ateliers* or art schools of well-known artists, and, in a measure, of the best-known life of Paris. Though art students have changed much in recent times, one still occasionally meets with survivals of that older type which might have served du Maurier for the characters in his world-famed novel *Trilby*. A good plan is to lunch at one of the restaurants to be found along the Boul' Mich' or Boulevard Montparnasse, which are frequented by artists and students of all kinds.

At the top of the first named thoroughfare stands the beautiful and ancient Palais du Luxembourg, erstwhile home of Marie de Médici, set in lovely gardens, and now the home of wonderful art collections.

In this section of Paris, south of the river, one finds, the Dome des Invalides, erected on the site of the tomb of St. Geneviève (422-512), in which is the tomb of Napoleon; the Panthéon, in which are buried, as an inscription (freely translated) states, "the great men whom France honours"; the charming Musée de Cluny, with its interesting collections dealing, among other subjects, with the life of Paris; the Jardin des Plantes, with Zoological Gardens; the Hôtel des Invalides, containing wonderful collections of weapons of all periods; the Hôtel des Monnaies (Mint); the Observatoire; the historic Sorbonne, in connection with which the new Cité Universitaire has been built, near the old fortifications on the southern outskirts for residential purposes; the École de Médecine; College de France; and other

departments of education. Along the river front we find, on the Quai d'Orsay, the Chambre des Députés, or Palais Bourbon; the Ministère des Affaires Étrangères; and other Government Offices; and, farther along, the Eiffel Tower, nearly 1000 feet in height, several times stated to be doomed to destruction yet still a landmark.

On the Île de la Cité and Île St. Louis, in the centre of the Seine, lying between the Pont Neuf and Pont Sully, are many ancient buildings of historic and architectural interest. They include the centuries-old Cathedral of Notre Dame; the Sainte Chapelle; the Palais de Justice; and the Conciergerie, where Marie Antoinette and Louis XVI were imprisoned.

Opposite, on the right bank of the river, is the Hôtel de Ville: farther along, towards the Place de la Concorde, stands the magnificent block of buildings constituting the galleries of the Palais du Louvre, wherein are world-famed art and other collections: the Bourse; the Archives Nationales; the Bibliothèque Nationale, containing nearly 3,000,000 volumes and MSS.; the Banque de France; L'Opéra; Comédie Française (National Theatre); Musée Carnavalet; the Trocadero; the Great Metropolitan Church of the Madeleine, which may be described as the St. Paul's of Paris; the historic Place de la Concorde, Rue de Rivoli and Avenue des Champs Élysées. All have historic interest.

With parks and open spaces Paris is well provided; they give a distinctive character. The world-famed Bois de Boulogne is one, with its leafy glades, lakes, open air cafés and restaurants; and the well-known racecourse at Longchamps. Another is the Bois de Vincennes, at the other end of Paris, with its historic chateau, used often as a prison. Under its time-worn walls, during the wars, a number of spies have faced firing squads; within the walls many reigning sovereigns and illustrious persons have died, and many famous people were imprisoned. Then there is the Parc des Buttes-Chaumont, in the eastern part of the city, with its lake, rocks and shady walks; in the opposite direction lies the comparatively little-known Parc Monceau, also with its lake, and Corinthian colonnade, once the gay resort of beauty and fashion. Not far distant is the Arc de Triomphe, in the shadow of which is the grave of the Unknown Warrior.

Up on Montmartre, crowning the heights of which stands the great white expiatory Church

of the Sacred Heart, one finds, in the narrow, steeply-climbing streets, many of which are rapidly passing away, fragments of the Montmartre of the past. The view from the platform of the Church on a fine day, or at night, is worth coming far to see. Close by is the Cemetery of Montmartre, in which lie buried many of the most distinguished Parisians.

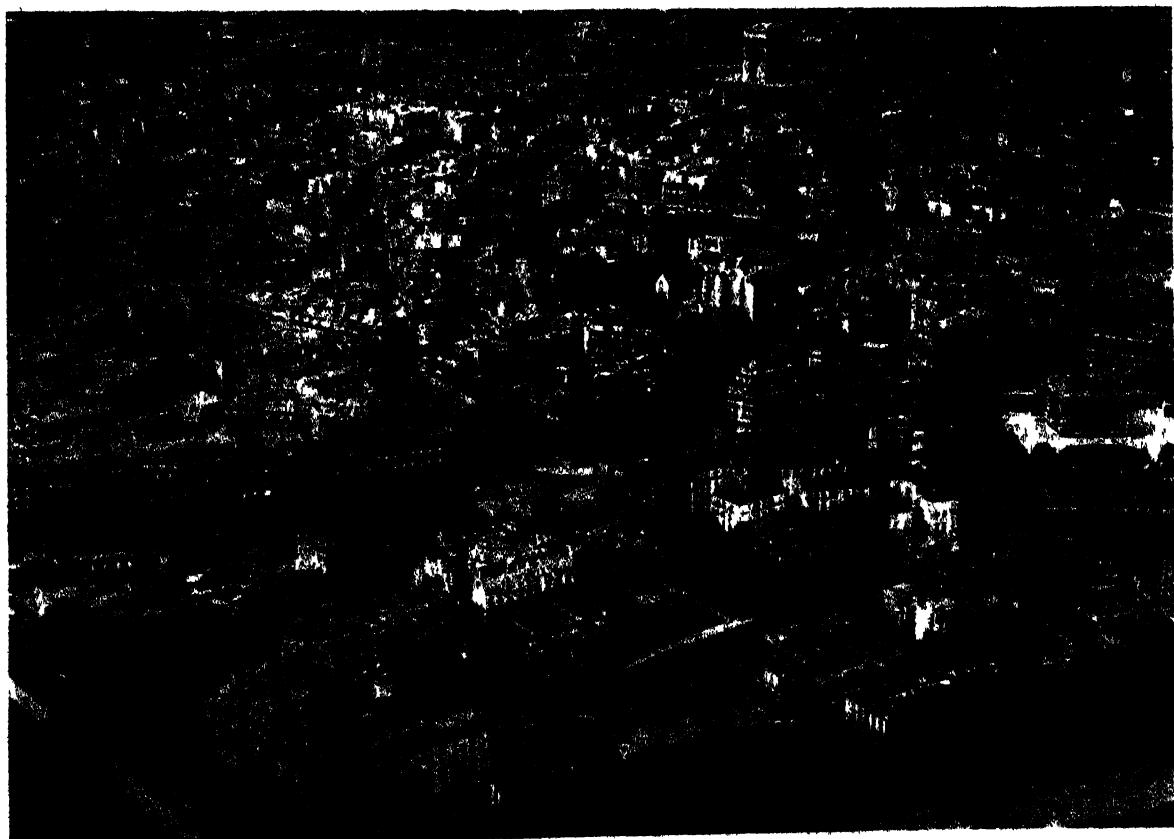
Much can be learned of the different strata of Parisian life and society at the cafés and restaurants on the boulevards, where, in the late afternoon and evening, countless Parisians of all classes foregather inside and out; and also in the cabarets of the light-spangled heights of Montmartre.

But it must not be thought that Paris is merely a city of pleasure and of beauty. Indeed, in the French capital and its suburbs nearly every kind of industry is carried on. It is, of course, the centre of the world of fashion, and those industries connected with this phase of its life are among the most flourishing. In the Marais we find leather works and coach works of motors, and carriage building; in the

Faubourg St. Marcel, chemical industries and gut works; in the Faubourg St. Antoine, cabinet making and carpentry; in the Faubourg du Temple, metallurgical works; while in the St. Ouen, Clichy and Pantin districts one finds jam, biscuit and tobacco factories, sugar refineries, carpet weaving, tanning and brick making works in the southern portions; and *articles de Paris*, *passmanerie*, and bronzes in the north-eastern quarters and districts just north of the île de la Cité.

In the Rue de Rivoli, Rue de la Paix and adjacent streets and boulevards are the dress houses and the shops of the great jewellers. In recent times many of the dressmakers of the highest class have tended to migrate farther west to the streets in the region of the Avenue des Champs Élysées.

Marseille, principal port and the second largest city of France, is situated twenty-seven miles east of the mouth of the River Rhône. It is a calling port for most of the great shipping companies. The Old Harbour is a natural basin around which the city is built. The new



PARIS

General view from the Eiffel Tower, showing the Arc de Triomphe in the background
Photo: Associated Press



THE FRENCH RIVIERA

Above. The Promenade des Anglais, Nice, a photo taken many years ago
 Below A rocky cove on the Côte d'Azur
Photos. Keystone, Wide World

harbour, with a water area of 414 acres, has many miles of quays, docks, and warehouses. Marseilles is connected by canals with the great waterways of Europe, and it is also an important industrial centre, manufacturing soap, oils, glycerine, flour, steam engines, motor cars, etc. It has many important ship-building and engineering yards, and is the centre of a considerable fishing fleet. The chief buildings of interest include the new Cathedral, the Notre Dame de la Garde, the Museum

André, consecrated in 1096, is remarkable for the beauty of its towers. Population (1946), 253,751.

Clermont Ferrand is a town important for its manufacture of chemicals and rubber goods. Population (1946), 108,890.

Le Havre, on the River Seine, is the next seaport to Marseilles in importance, and has important industrial activities, including the manufacture of heavy guns and battleship building. Population (1946), 106,934. **Lille**,

of Antiquities, and the Palais Longchamp. Population (1946 census), 636,264.

Lyons, third in size of the French cities, is built at the confluence of the Rivers Rhône and Saône. It is a most important manufacturing centre and has the greatest silk industry in the world. It has also a large trade in coal, chemicals, metal goods, wine, spirits, cheese, etc. The geographical position gives great importance as a connecting link between central and southern Europe. Lyons has many ancient chapels, churches, and monasteries, including the early Gothic cathedral of St. Jean, begun in 1110; the ninth-century Church of St Martin d'Ainay; the medieval church of St. Nizier, and the Hôtel Dieu, founded in the sixth century. Population (1946), 460,748.

Bordeaux is a seaport, situated on the plain on the bank of the River Garonne, about sixty miles from its mouth. Navigation as far as Bordeaux is good, even for trans-Atlantic vessels. Principal industries are connected with the manufacture of brandy, liqueurs, vinegar, earthenware, woollen goods, and glass-blowing. There is also a large number of sugar refineries. Shipbuilding and fisheries are important, and there is a substantial export trade in potatoes and pit props. The Cathedral of St.

on a sub-tributary of the Scheldt, is a manufacturing town and fortress. The smelting of iron, spinning of linen and cotton, manufacture of damask, cloth, tulle, tobacco, paper, machinery, dyeing and bleaching, and distilling, are its main industries. Population (1946), 188,871.

Nancy, on the River Meurthe, has important works connected with woollens, cottons, and chemicals. Population (1946), 113,477. **Nantes**, on the right bank of the River Loire, thirty-five miles from the sea, is described as one of the finest cities of France. Shipbuilding is one of the main industries, and others are the preparation of sardines, the manufacture of thread, leather, nets, soap, and machinery. Its cathedral dates from 1434. Population (1946), 200,265. **Nice** is a famous winter resort on the Riviera, its mild climate being chiefly due to the shelter from cold winds afforded by the Alps. The Old Town consists of narrow streets clustered at the foot of Castle Hill, a rocky height on which there are castle ruins. The resort has more than two miles of beautiful promenades. Chief manufactures are olive oil, pottery, and perfumery, and there is a large export trade in flowers. Population (1946), 211,165.

Reims, famed for its cathedral, is in the centre of the champagne producing country and in addition manufactures woollens, glass, chemicals, and machinery. Population (1946), 110,749. **Roubaix** is the centre of the French woollen industry. Population (1946), 100,978. **Rouen** is a port on the Seine, its commercial importance resting on the manufacture of cotton and textile goods. Population (1946), 107,739.

Strasbourg, capital of Alsace-Lorraine, is on the River Ill, and is connected by canals with the Rivers Rhine, Rhône, and Marne. Its proximity to Germany and Switzerland makes it an important trading centre. It has a

great variety of manufactures including beer, leather, cutlery, and chemicals. The cathedral was built between 1277 and 1439 and is considered to be one of the finest examples of Gothic architecture in existence. Population (1946), 175,515.

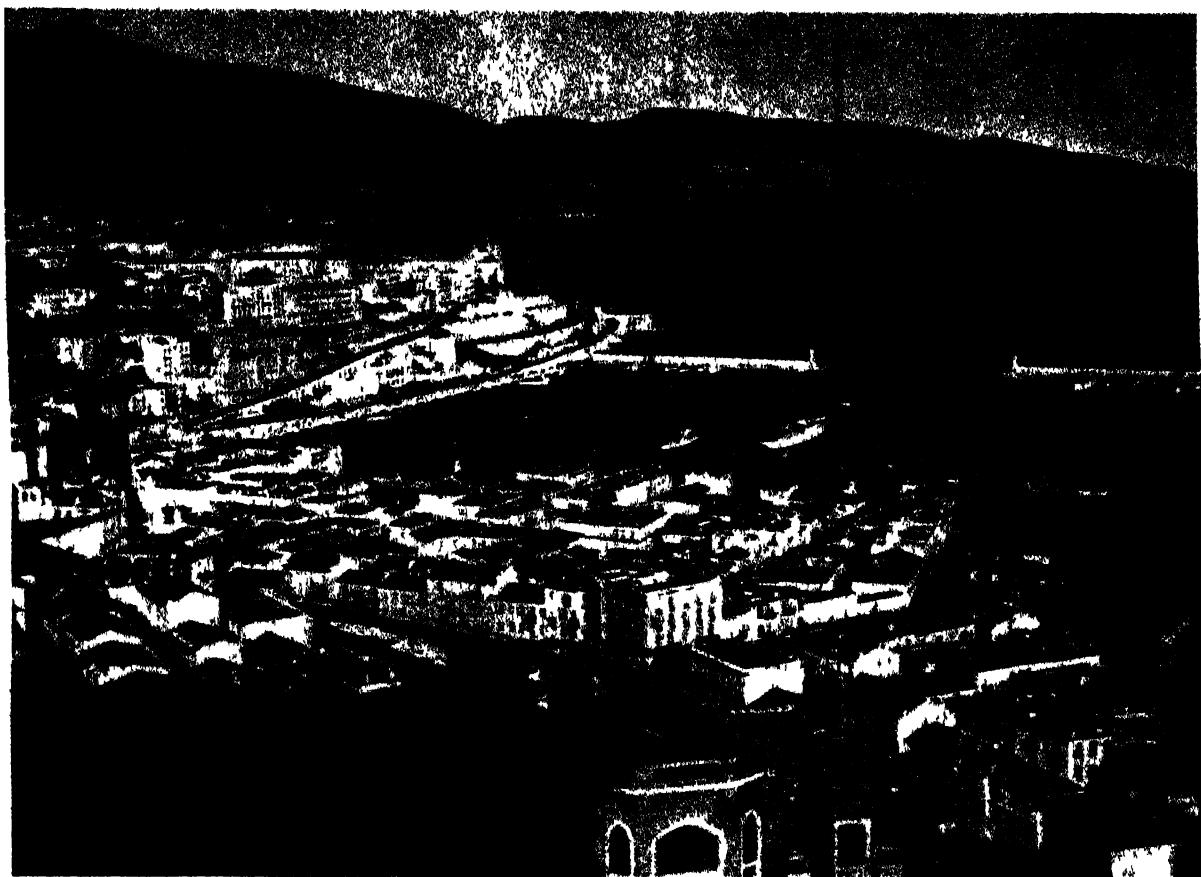
Toulon is the chief French naval port on the Mediterranean. Shipbuilding, lace, and fishing are its chief industries. Population (1946), 125,742. **Toulouse** is situated on the right bank of the River Garonne and at the junction of the Lateral and Midi canals. The chief industries are connected with woollens, silks, leather, tobacco, gunpowder and paper. In normal times Toulouse carries on an important trade with Spain. Population (1946), 264,411.

Other Cities. In addition to the fifteen cities already mentioned there are in France thirty-nine of more than 50,000 inhabitants. Among the most important are: **Amiens**, on the River Somme, a wool and textile town (84,787); **Brest**, in the department of Finistère, an important seaport and naval station (74,991); **Dijon**, at the junction of the Rivers Ouche and Suzon, making woollen goods, hosiery, chemicals and paper and noted for its mustard (100,664); **Le Mans**, by the River Sarthe, making chemicals, woollen and linen goods (100,455); **Limoges**, on the River Vienne, famous for porcelain (107,857); **Nîmes**, near which is the famous Roman aqueduct, the Pont du Gard, a centre for wines and brandy, silks, cotton goods and carpets (91,667); **Rennes**, at the junction of the Rivers Ille and Vilaine, an agricultural centre (113,781); **St. Etienne**, famous for ribbons (177,966). In addition, **Boulogne-sur-Seine** (86,230); **Mulhouse** (87,655); **Grenoble** (102,161); **Montpellier** (93,102); **Angers** (94,408); **Tours** (80,044); **Metz** (70,105); **Villeurbanne** (82,399); **St. Denis** (69,939); and **Tourcoing** (76,080) had large populations in 1946.

The Overseas Territories of France

FRENCH overseas departments and territories in northern Africa (see article entitled *North Africa* in Volume Two) include Algeria, 847,400 square miles in area with a population of 8,676,000; Tunis, 48,300 square miles with a population of 3,230,950; and Morocco, 161,500 square miles in area with a

population of 8,500,000. *French West Africa*, including Senegal, Mauritania, French Sudan and French Guinea, Dahomey, Niger and the Ivory Coast, has an area of 1,779,947 square miles and a population of 16,535,000. The administrative centre is Dakar. *French Equatorial Africa*, including Gabon, the Middle



MONACO AND MONTE CARLO

On the right (p. 189) is the Palace of the Prince of Monaco, on the left the panorama includes the sea front of Monte Carlo where the largest building is the Casino, with the Alpe Maritime in the background

Photo Central

Congo, Ubangi-Shari and Tchad, covers 891,800 square miles and has a population of 4,350,000. Its administrative capital is Brazzaville. French East Africa includes the island of Madagascar, 231,250 square miles, population 4,295,000; the smaller island of Réunion, 970 square miles, population 260,000; and the territory of French Somaliland, 9071 square miles, population 55,000.

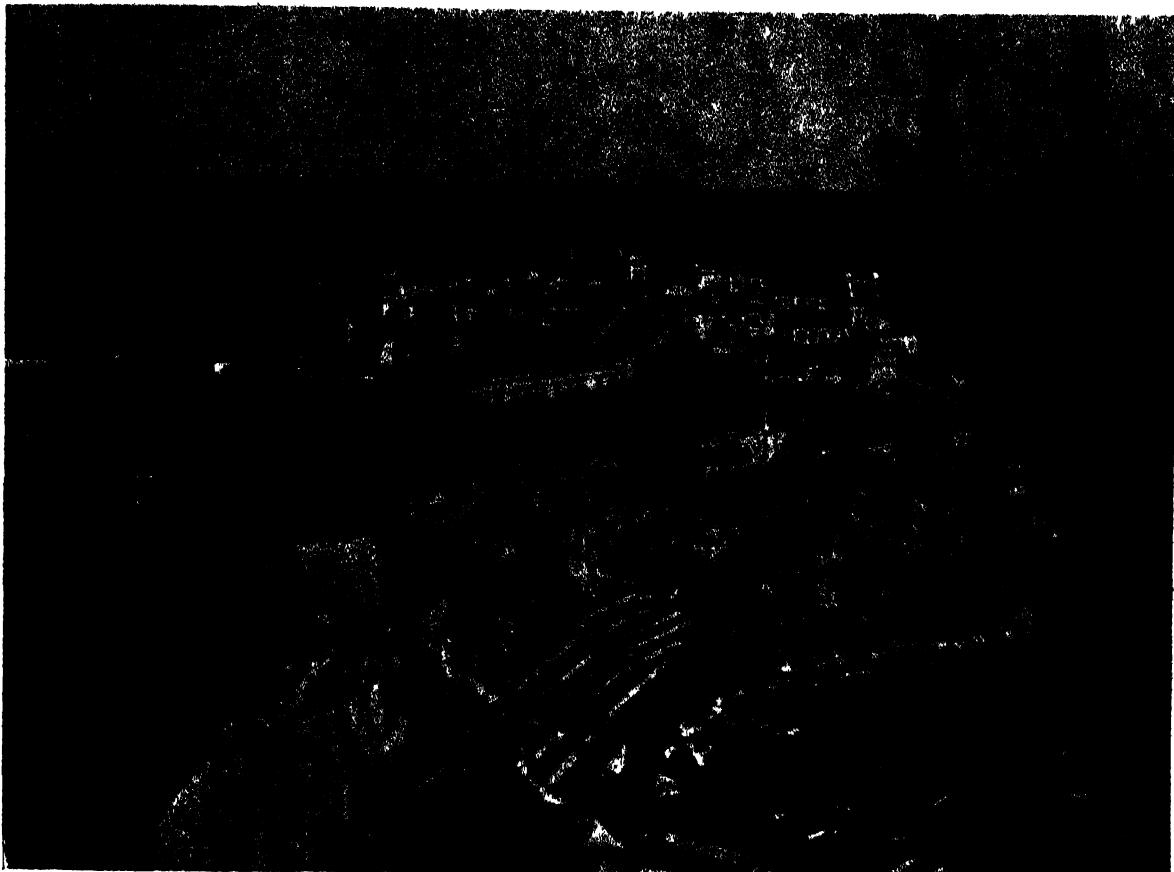
In addition, the territories of *Togo*, 20,500 square miles, population 971,600, and *Cameroon*, 166,000 square miles, population 3,000,000 (formerly held as mandates under the auspices of the League of Nations) are now administered by France as trustees for the United Nations.

In Asia, French India has an area of 200 square miles and a population of about 360,000, Pondicherry being the chief settlement. Chandernagore was ceded to the Republic of India in 1952. Indo-China (see article Southern Asia and Indonesia in Volume Two) has

an area of 286,000 square miles and a population of 27,600,000. Saigon is the capital.

French possessions in America include Guadeloupe and Grande Terre in the Lesser Antilles (The West Indies in Volume Three) with its capital at Basse-Terre, area 530 square miles, population 240,000; Martinique with its capital at Fort-de-France, area 385 square miles, population 264,000; the St. Pierre and Miquelon Islands off the south coast of Newfoundland, ninety-three square miles and 4350 inhabitants; and French Guiana (see article The Guianas in Volume Three), with its capital at Cayenne, area 34,740 square miles and population 30,000.

In the Pacific (see article The Islands of the Pacific in Volume Three) France possesses New Caledonia, 8550 square miles and 61,250 inhabitants; it jointly administers the New Hebrides, and also owns many islands and island groups of which Tahiti, in the Society Islands, is the most important.



Monaco

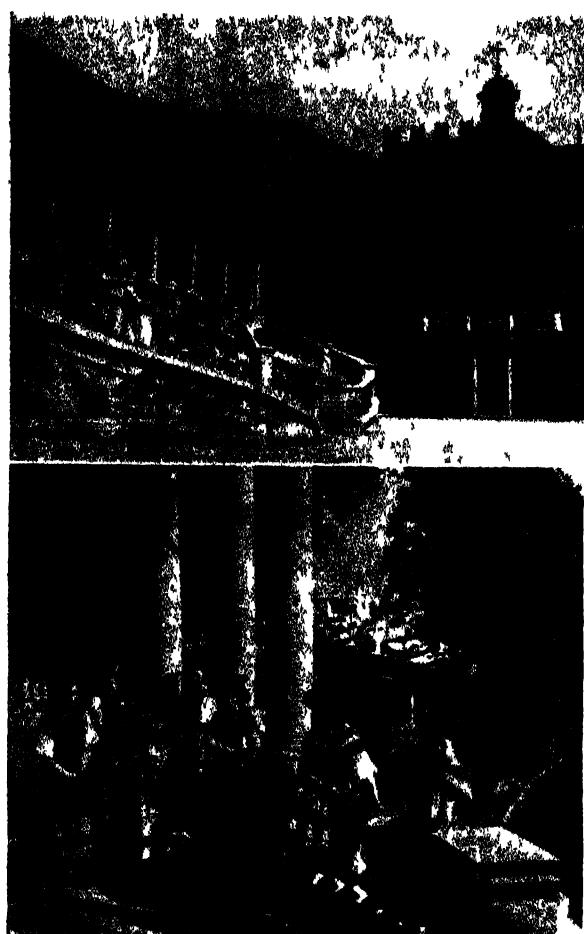
MONACO, famous as a pleasure resort and for its gambling facilities, is a small Principality in south-eastern France, consisting of a promontory and a narrow strip of coast about three miles long and less than two miles wide. The whole of its territory has either been built over or has been converted into gardens. The climate is milder than that of any other place on the French Mediterranean coast, due to the shelter afforded by formidable protecting mountains. To the south-west are the Cap d'Ail Mountains; to the west and north-west the Tête de Chien, the Turbia, the Montagne de la Bataille and du Forna; to the north and north-east, Mont Agel, Mont Justice and Mont Gros; while a little farther away are the Rocquebrunne Mountains, 1437 feet high, and the Cap Martin.

Palms and aloes grow abundantly in Monaco and there is produced a sufficient

amount of olive-oil and perfumes to justify an export trade in their products, in exchange for coal and wine.

The pleasant climate and the charm of the coast have helped to make Monaco one of the most attractive resorts in the world, but only when Monte Carlo, the Principality's most noted centre, became famous for its gambling facilities did the State grow in wealth and population. In 1848 it had but 1200 inhabitants, by 1900 this total had grown to more than 15,000, and by 1951 it was 20,202. It has been estimated, however, that the native Monegasques number fewer than 2000, the remainder of the permanent inhabitants being representatives of all nationalities. As Monaco has no Customs barriers and no taxation, all revenue being derived from the gaming tables, it attracts many residents from other countries.

There appear to have been gambling tables



MONACO

Above The sixteenth-century chapel of the Prince of Monaco
Below Girls in national costume who pick oranges each harvest time from the groves which encroach on the streets of Monte Carlo

Photos: Central

in Monte Carlo in 1856, but they developed in importance in 1861 when François Blanc obtained a fifty-year concession. This concession in 1898 passed into the hands of a joint-stock company, which obtained an extension to 1947, in return for substantial payments and annual tributes to the Prince of Monaco. The wealth produced by the gambling tables and fulfilling the needs of Monaco's yearly 1,500,000 visitors provides the population with its main source of livelihood. The attraction for gamblers to Monaco as against France has been, until recent times, that roulette is said to be more exciting than other forms of gambling. Until August, 1933, Monaco had a virtual monopoly of roulette, but when the French Government gave permission for the game to be played in the larger French casinos, Monte Carlo experienced severe competition.

Subsidiary to catering for pleasure are the domestic crafts of producing woodwork and pottery, in which the people of Monaco-ville are adept, and the manufacture of perfumes and liqueurs at La Condamine. None of the inhabitants has access to the gaming tables.

The Principality consists of three Communes, Monaco-ville, Monte Carlo and La Condamine which are municipally administered. The density of the population is roughly 1000 per square kilometre.

Monaco-ville, the capital, occupies the level summit of a rocky headland, rising about 200 feet from the shore, and surrounded by ramparts that give it a picturesque charm. It has many buildings of note, the chief of which is the Palace. This is now largely modernized, but originally it was a castle of the thirteenth century, being enlarged by the Grimaldi family about 1630, and decorated in the Renaissance style. The Cathedral of St. Nicholas is a grand Romanesque-Byzantine building, completed in 1897. Opposite the Cathedral is the Museum of Prehistoric Anthropology, containing a collection of important relics belonging to different periods of the Stone Age. These were found in caves in the neighbourhood and include the Palaeolithic finds from the Grimaldi Grottoes near Mentone.

The Oceanographical Museum is another of Monaco's finest buildings. It stands at the edge of the cliff, rising from the sea at the gardens of St. Martin. The museum was designed to house the collection made by the Prince during twenty-five years of oceanographical research. The streets of Monaco-ville are narrow and winding.

La Condamine, the new part of the Principality, an agreeable health resort in winter, lies in the bay below the rock. The chief thoroughfare is the Boulevard de la Condamine, leading along the shore to Monte Carlo. The harbour, about forty-two acres in area, is well sheltered and is the meeting place of hundreds of yachtsmen during the season. To the north of the bay on the rocky slopes of Spelugues are grouped the various buildings of the Casino of Monte Carlo with the gardens and the innumerable villas that it has called into existence.

Monte Carlo is essentially a city devoted to pleasure. In summer time its beach is crowded and in winter there is a round of galas and fetes. Of its buildings, the most famous is the Casino, built to the design of Charles Garnier, architect of the Paris Opera House.

GERMANY

GERMANY is by far the most important country of central Europe. The term central Europe, coined in late Victorian days, is, from the geographical point of view, not quite unequivocal; it is mainly justified by certain economic and cultural bonds between Germany and her neighbours.

Germany is, on account of its geographical position, the natural mediator between northern and southern Europe and it fulfils the same function in regard to western and eastern Europe. It is indeed frequently stated that the Elbe, which traverses the country from south to north, forms the border-line between western and eastern Europe.

A survey of modern Germany is practically a survey of Germany in 1937 before her conquests, with allowances made for the 1945 German-Polish frontier.

In 1938 Germany, then a country of about 181,700 square miles and 67,578,000 people occupied and added to herself Austria and the Sudeten lands of Czechoslovakia, areas of about 32,380 square miles with 6,760,000 people and 10,800 square miles with 3,600,000 people respectively. Thus the Germany which went to war in 1939 was a country of some 224,880 square miles and 79,000,000 people. By 1940 Europe had virtually become Germany.

The Reich controlled Norway, Denmark, Holland, Belgium, France, Czechoslovakia, Hungary, Romania, Bulgaria, Greece, and part of Poland. Switzerland, Spain, and Sweden were neutral; Italy was an ally of Germany and Russia had a pact with her; only Great Britain remained.

Discussions in 1945 on the German Peace Treaty resulted in the restoration of independence to Austria and the Saar, and the granting to Poland of new territory inside the Oder-Neisse Line (whereby Poland gained part of East Prussia and the towns of Stettin, Liegnitz and Breslau). Germany is thus smaller territorially than she has been since the days of Bismarck.

Germany has the greatest number of neighbours of any country in Europe. Apart from the long coast line on the north, it borders on nine other countries; in the north on Denmark; in the west on Holland, Belgium, Luxembourg and France; in the south on Switzerland and Austria; in the east on Czechoslovakia and Poland.

As Germany extends from west to east over about nine degrees of longitude, the natural difference in time between eastern and western Germany is approximately half an hour. Central European Time is, however, observed throughout the whole country.

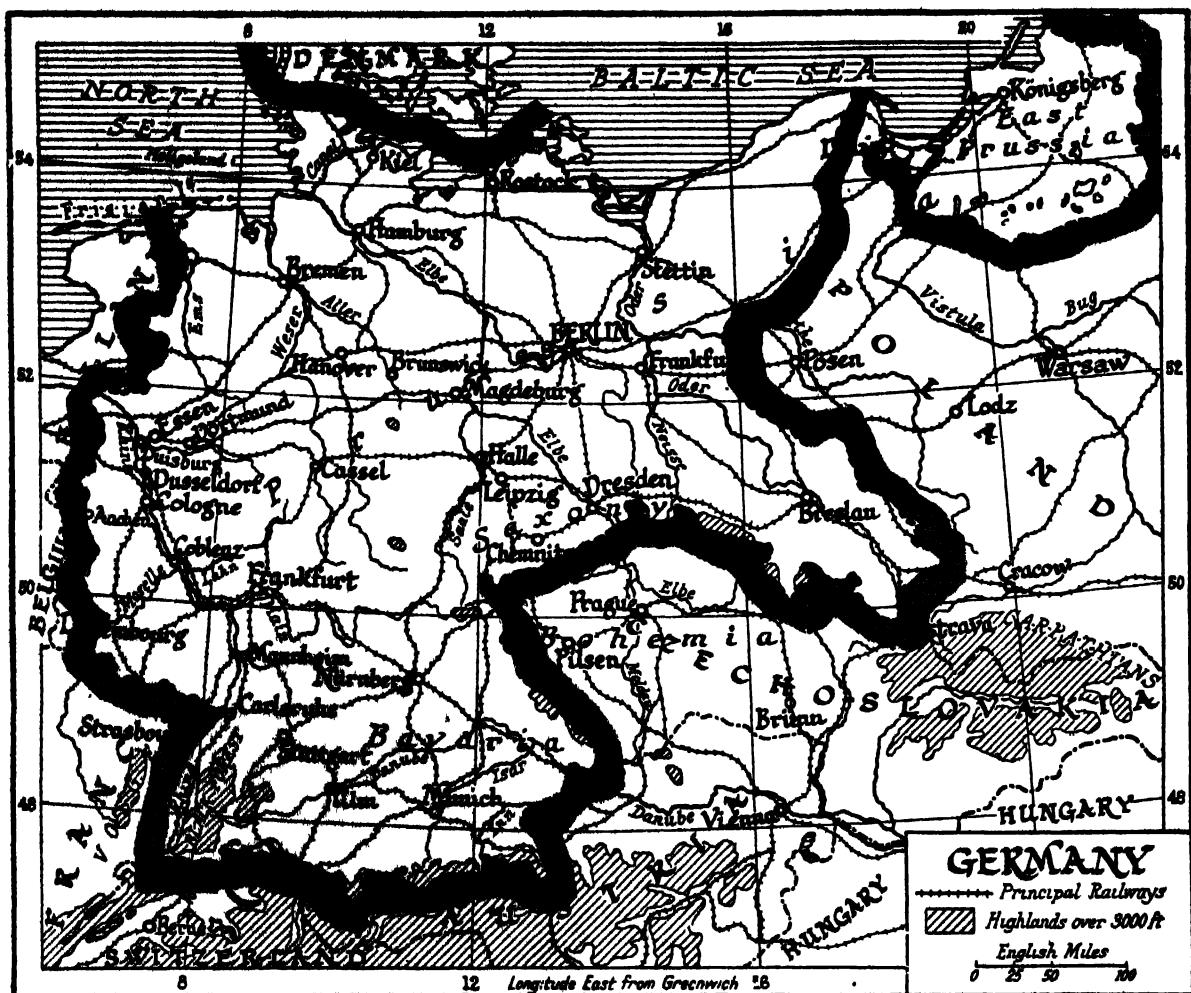
The Land and the People of Germany

GERMANY can be divided into three large natural regions, of which the first mountain chain (the Alpine part), situated in the south, covers a comparatively small area. The intermediate mountain chains extend from south-western Germany to central Germany, and parts of south-eastern Germany can also be included in this region.

By far the largest part of the country, however, is occupied by the North German Plain. Southern and central Germany grow slightly

wider in a westerly direction while northern Germany expands towards the east. Apart from these three zones mention must be made of the natural landscape of the Rhine Province; here, too, lies the only large plain in southern Germany, the lowland of the Upper Rhine.

The German part of the Alps extends along the southern frontier of Bavaria in a width of about fifteen miles. The Bavarian Alps are famous for the variety and beauty of their scenery, but trade routes are impeded by the



GERMANY, 1937

(Cologne = Köln; Munich = München; Pilsen = Plzen; Prague = Praha; Vienna = Wien; Warsaw = Warszawa)

This map shows Germany before the inclusion of Oesterreich (Austria) and of the Sudeten areas. A map showing the 1939 frontiers appears on page 208. The post-war frontiers are shown in the map on page 216.

numerous narrow valleys. Several routes wind their way in a zigzag fashion from north to south through various river-valleys, but only one great highway, the Brenner Railway, traverses the German Alps. The region of the Allgäu Alps is rich in pastures; its highest elevation, the Grosse Krottenkopf, reaches 8715 feet. Farther to the south are the Ammergau Mountains, rich in woodland, and also the Wetterstein Mountains, closely interspersed with chalk; here, between the Rivers Isar and Loisach, rises Germany's highest mountain, the Zugspitze, to its 9725 feet. The boundary between Bavaria and Austria runs through the mountain; cable-railways on both sides lead to the summit. To the east of the Inn Valley lie the Chiemgau Alps. The Bavarian part of

the Salzburg Alps, the centre of which is Berchtesgaden, consists of wide rocky plateaux with the Watzmann (8902 feet) as its highest elevation. In the shelter of its eastern slopes lies the most beautiful lake of the German Alps, the Königssee.

To the north of the actual Alpine belt a high plateau extends to the Danube: the Alpine foreland, bordered in the east by the ranges of the Bavarian and Bohemian Forests. In the west we find the Swabian-Frankonian Alb, descending comparatively steeply to the Main-Neckar river basin. The lowest part of this basin in the south-western corner of Germany is formed by the narrow Rhine Lowland, which extends sleeve-like to a length of 180 miles, bordered on the right by the Black

Forest and on the left by the Vosges Mountains. The southern part of the Black Forest, justly famed for its beauty, boasts the highest elevation in south-western Germany, the Feldberg (4897 feet).

From the Maas in the west to the Oder in the east stretches the wide belt of the Central German Mountain Range, which separates the south-German regions from the North German Plain. This region falls into a number of large natural landscapes: in the west the Rhenish Slate Mountains, with wide high plateaux but modest summits. Eifel (2447 feet) and Taunus (2864 feet), continued by the Hessian and Wesenberg hill country, with Rhon and Teutoburger Wald (forest), Thuringia, and, pushed far up to the north, the Harz with the Brocken (3746 feet). To the east follow the Ore Mountains and the Sudeten Mountains. The eastern frontier that was decided upon in 1945 ends roughly at the beginning of the Giant Mountains where the

river Neisse rises. This range is almost Alpine in character and the mountains reach considerable heights.

The North German Plain is part of the great northern European plain which stretches from Normandy to the Ural Mountains. West of the Elbe the north-German lowland is mainly flat, and often covered with moors and heathland, east of the river the country becomes in places more undulating, but showing only small differences in height. Several groups of lakes, small and large, lend variety to the landscape. The northern part is occupied by the Baltic Hill Range in the east, which rises to 900 feet, passing towards the sea into a coastal lowland of changing width.

The Rivers. Germany declines from the south to the north, and all the great rivers of the country which flow into the North and Baltic Seas follow this incline almost without exception, only the Danube (Donau) maintains a west to east direction. Of the important



DUISBERG
A view of the inner harbour
Photo Associated Press

rivers, the Rhine, the Elbe, the Ems, and the Weser flow into the North Sea and only the Oder, the river on the border of eastern Germany, into the Baltic Sea.

The Rhine, easily Germany's most important river, has its source in the neighbourhood of the St. Gotthard in Switzerland. It begins its run through Germany near Basle and its mouth is on Dutch soil. For only slightly more than



A TYPICAL VILLAGE

Zons, with its church and old cottages looking across fertile meadows
Photo Landesfremdenverkehrsverband Rheinland e.V.

half of its entire course (820 miles) it runs through Germany, but quite apart from the world-famous beauty of the Rhine Valley, the economic importance of the river for western Germany is inestimable. The Rhine basin is one of the most fertile and most closely populated parts of the country and even more important is the river as a trade route. Sea-going vessels sail up to the industrial regions, bringing ores and raw materials from overseas to return laden with coals and finished goods.

The Elbe is likewise a commercial highway of the first importance; it has its sources near

the German frontier with Czechoslovakia, but covers a great part of its course before it reaches Germany in a quite different region at the Saxonian frontier. Connected through many canals and other waterways with important industrial regions, the Elbe reaches the North Sea beyond Hamburg, which owes its position as the greatest port on the Continent to its situation on the mouth of the Elbe.

The Oder, which used to be Germany's longest and one of her most important rivers, now flows for most of its course through Poland and only serves Germany by marking the northern part of her eastern frontier. It enters the Baltic Sea at Stettin (also Polish). Below Frankfurt, the frontier follows south along the Neisse while the Oder stretches back into Poland. The Danube, the second longest and most international river in Europe, springs from the Black Forest and takes its course through Germany until Passau. The Weser is a purely German river, source and mouth being within the country's frontiers. The regions of the Rhine, the Elbe, and the Oder, with their tributaries, are the most important of the North German Plain.

The Lakes. Germany's lakes are in many cases distinguished by their beautiful scenery, and the fishing they offer is a modest source of living to many of those settled on their shores, but they are comparatively small and as commercial highways of hardly any importance. The exception is the international Lake of Constance (Bodensee), lying between Germany and Switzerland, and of whose surface area (208 square miles) the German share is 118 square miles. We must not forget the small but very attractive lakes of the Bavarian Alps: the Chiemsee, the Starnbergersee, Ammersee, Tegernsee, etc.

Islands. Several islands, of medium or small size, in the Baltic and North Seas belong to Germany. The entire area of these islands is 917 square miles, i.e. 0.4 per cent of Germany's territory; the most important is the island Rügen, in the Baltic Sea, now connected with the mainland (Stralsund) through the artificial Rugendamm. Of the other Baltic Sea islands mention must be made of: Usedom, Wollin, and Fehmarn; of the North Sea islands Sylt, Föhr, Borkum, Norderney, and Heligoland are among the best known.

Climate. Apart from situation and quality of the soil, character and extent of agricultural production are mainly dependent on the climate. Germany's climate is, especially during the

winter, strongly influenced by the Gulf Stream. Whereas during the summer the southerly regions are warmer than the northern ones, in winter western Germany, being nearer to the sea, is warmer than the east.

It is possible to distinguish between three main climatic regions: the moist region of the North Sea, the colder region of the Baltic Sea, and the dry inland region with its warm

year. The average annual rainfall is 24–28 inches in the west as against only 20–24 inches in the east.

Area and Population. Despite her loss of territory after the 1939–45 War, Germany is still, after Russia, the most populous country in Europe. In 1950 the population was estimated at 68,200,000, of whom nearly 48,000,000 were in the Federal Republic.



THE BLACK FOREST
View in the Gutach Valley
Photo: German State Railways

summers and cold winters. The mean average annual temperature is about 46° ; we find the warmest climate in the Rhine lowland, the coldest in the Alpine regions. The North Sea has a warming effect during autumn and winter, while the Baltic Sea often freezes up, thus causing lower temperatures in the adjoining regions. The rivers in the east of the country are, on account of the ice, frequently not navigable for several months, in contrast to the Rhine, which on the average does not carry ice for more than three weeks in the

Before the 1914–18 War the German Empire consisted of a number of independent kingdoms and principalities, which even in the years after that war, as republics, were free to have their own legislation and administration almost independently from the "Reich." In 1933 Germany became a centralized state, governed directly from the capital, Berlin. The former states, however, continued to exist nominally as administrative units, like the Prussian provinces, which mostly were as large and populated as any of the former kingdoms. Prussia was the biggest state

in Germany; with 113,012 square miles and 40,000,000 inhabitants it comprised, in 1939, approximately three-fifths of the area and the population of the country and it has been the cradle of Germany since 1860.

The several states and the individual Prussian provinces were economically closely interwoven with each other and the central government; nevertheless, from natural and historical causes, special conditions have evolved in these regions which will be entered into later.

The Main, a tributary of the Rhine running



A NEW PHASE OF AGRICULTURE

Tobacco growers collecting the crops from one of the many tobacco fields in the neighbourhood of Schmedt.

Photo: Planet

from east to west, separates southern Germany from the much larger northern Germany. Considerable differences in regard to culture and dialects are to be found between these two parts of the country. But from the economic point of view, the Elbe, which separates eastern from western Germany, is perhaps even more remarkable. Taking a wide view, western Germany is more industrialized, eastern Germany more agricultural. Even in the structure of agriculture we find considerable differences between east and west Germany. Small and medium-sized farms and stock-farming predominate in the west of the country; big estates and grain-growing are the main features of agriculture in the east.

Southern Germany and large parts of western Germany are inhabited by the German tribes of the Alemans, Franks, Swabians, Baju-

warians, and Upper Saxons; north-western Germany is predominantly the home of the Lower Saxons and the Frisians along the coast. The population of the large north-east German lowland consists more or less of a medley of all the German tribes with a frequent admixture of Slav elements, which, however, have been almost completely Germanized in the course of the centuries. This region was originally a German colonial settlement, which was rendered productive only after intensive labours. Accordingly it is even to-day on the whole much more sparsely populated than the other parts of the country. The population per square mile was, before the 1939-45 War, in Brandenburg 181, in Pomerania 164, in Westphalia on the other hand 645, and in the Rhineland even 823.

We obtain a similar picture if we look at the distribution of the population in town and country. 32.8 per cent of Germany's population live in places of less than 2000 inhabitants, and can therefore be classified as rural population; in normal times, again before the 1939-45 War, the proportion of the rural population in Pomerania was 49 per cent, in Brandenburg 45.1 per cent, in western Schleswig-Holstein, however, only 31.7 per cent, in Westphalia no more than 15.2 per cent, and in the Rhineland 15.9 per cent.

These differences in the distribution of urban and rural population in the different provinces of Germany cannot only be attributed to the prevalence of industry or agriculture respectively in those regions: the Province of Brandenburg, for instance, with its larger proportion of the rural population is more industrialized than Schleswig-Holstein, which is decidedly a farmer's country. The discussion of these conditions leads us to a description of the structure of German agriculture.

Agriculture. In contrast to English and French agriculture private ownership of farms predominates in Germany; only 10.7 per cent of the entire cultivable area are leasehold property, as against approximately 86 per cent in Great Britain and 47 per cent in France.

This means that in Germany, on the one hand, relatively many agricultural labourers are working on the big estates in the north, but that these estates are extensively cultivated, chiefly producing grain, while stock-farming is less developed. The farms of the west and south-west, however, small and medium-sized, are more adjusted to cattle-raising and dairy-farming; those districts are the seats of a

population of peasants, who have tilled their own soil for centuries.

Only slightly more than a quarter (actually 26 per cent) of Germany's population derive their living from the land. In the Russian Zone large estates have been divided up without compensation and distributed among more than a million agricultural workers and refugees from the area under Polish administration. Large estates, however, still exist in the north of the Federal Republic. In the central

The staple products of German agriculture are rye and potatoes; in regard to wheat Germany is an import country. The most important rye areas lie in the north-eastern plain, now centred on Mecklenburg. (East Prussia, Pomerania and Silesia used also to be most valuable.) These districts are also the most important potato-growing regions; their annual yield is much in excess of their own needs and thus they supply the big cities and the western industrial districts.



THE GREAT PLAIN OF GERMANY
Pastoral fields of the north east, part of Germany's best cattle land
Photo German State Railways

German provinces of Saxonia and Thuringia only 8·3 per cent and 17·9 per cent respectively are employed in agriculture, and likewise in the west German provinces of the Rhineland and Westphalia only 12 per cent of the population is agricultural.

We obtain a similar picture by showing the proportion of big estates in the different parts of the country before the war. Nearly one-fifth of Germany's agricultural area was claimed by the big estates. But in Mecklenburg it was 54 per cent, in Pomerania 45·4 per cent; in the western and south-western regions, on the other hand, in the Rhineland, in Westphalia, Württemberg, and Baden, their share was only between 3 per cent and 7 per cent.

Wheat is grown in the Magdeburg Basin, and in the valleys of the Rhine and Danube. For sugar-beet, Brunswick, the Magdeburg Basin and Hanover are of importance. Lower Silesia, again, used to be a most important area for these crops. The position is different for fruit-culture. While the north-east is the most important region for cereals and potatoes, and while stock-farming predominates in the north-west, central and especially southern Germany have the largest amount of productive fruit-trees. The chief wine-growing areas are in the west and south-west of the country. The Moselle and Ruhr districts, the Bavarian Palatinate, the lower valley of the Neckar, the Markgraefler district in Baden and the

neighbourhood of Worms are the more important centres.

Germany possesses considerable forests; its wooded area comprises 24,000,000 acres, of which about three-quarters are coniferous and one-quarter foliaceous. The districts richest in forests are naturally to be found in the mountainous regions of the country: in Bavaria, Württemberg, Hessen-Nassau, and in the Rhine-land; but the plains of the north-German lowland, too, are in parts covered with dense

deposits of about 57,000,000,000 tons. By far the most important mineral coal district is the Ruhr, with a reserve of about 55,000,000,000 tons; another important coal region lies at Aachen. The valuable regions of Silesia have now gone to Poland, and the Saar has become an independent state. Germany is the biggest brown coal producing country in the world, achieving nearly 75 per cent of the world output; the chief mining districts are in central Germany, in Thuringia, Saxonia, in the Lower



NEIDERHEIMBACH

The castle and village looking across the Rhine to the dense woods which cover the slopes on the farther bank

Photo Landesfremdenverkehrsbund Rheinland e V

forests. Forestry offers at least the rudiments of a living to many of the population, and especially in the poorer mountain districts, whole villages live on the products of the forest and indirectly as the carvers and makers of the famous and fascinating wooden toys known to many generations.

Mineral Resources. Even more important for the economic life of Germany are the forests which in pre-historic days were deposited underground in the form of coal. Germany is comparatively poor in ores, but as a coal-producing country it is, in Europe, only surpassed by Great Britain; the entire coal deposits are estimated at about 80,000,000,000 tons, to which must be added brown-coal

and Upper Lausitz, and in the Brunswick-Magdeburg region. In the Rhineland, too, around Köln (Cologne) and Düren are considerable deposits.

Next to coal, potash is Germany's chief mining product (more than half the world output). The main deposits are in the Stassfurt-Magdeburg region, in Hanover, in the south Harz and in the Halle-Mansfeld district.

The iron-ore deposits of the country are comparatively few; the chief mining districts are in the Harz and Westerwald. Copper is also mined in the Harz. Large uranium mines in Saxony have been worked from 1945 under Soviet direction. Amber, which is found almost exclusively in what was formerly East Prussia,

along the coast of Samland, is now, of course, no longer a German speciality.

The Länder. In 1946 the state of Prussia was liquidated and a number of territorial revisions have taken its place. As a result the zones are now composed of the following states (*Länder*)—

British Zone

Schleswig-Holstein; Lower Saxony (including the former Prussian province of Hanover); North Rhine-Westphalia; Hamburg.

U.S. Zone

Bavaria; Württemburg-Baden; Hessen; Bremen.

French Zone

Rhineland-Palatinate; Baden; Württemburg-Hohenzollern; Saar.

Soviet Zone

Brandenburg; Saxony (including part of the former province of Silesia on the left bank of the Western Neisse); Saxony-Anhalt; Thuringia; Mecklenburg (including part of Pomerania). For administrative purposes these *Länder* were in 1952 subdivided into 14 districts.

Lower Saxony and Schleswig-Holstein. In the north-west corner, where the Great Plain meets Holland, lies to the east of the Ems estuary, on the coast of the North Sea, East Friesland, with a chain of islands, the Frisian Isles, following its coast-line: Wangeroog, Spiekeroog, Langerooog, Baltrum, Norderney, Borkum, among others. The inhabitants of the coast derive their living from navigation, fishing, but also agriculture; the marshy regions near the coast are exceedingly fertile. The Ems estuary has won great economic importance through the Dortmund-Ems canal: it connects, within the boundaries of Germany, the Rhine with the North Sea. Between the Ems and the Elbe lies the Lower Saxon plain. The coastline is fertile but farther inland this part of Germany is covered by vast areas of moor and heathlands. Near the Dutch frontier lies Bourtanger Moor; farther east near the town of Verden begins the large Lüneburger Heath, extending through the whole province of Hanover as far as the town of Lüneburg. Lonely homesteads, the "Heidjer" and isolated villages scattered far apart bear witness to the barrenness of the sandy soil.

The coastland between the Weser and the Elbe lies on the Bay of Heligoland. Here we find good arable land and rich pastures; it is a typical farmer's country.



THE KIEL CANAL

Photo Blue Star Line

Beyond the Elbe estuary, between North and Baltic Seas, lies the peninsula of Schleswig-Holstein, whose northern part belongs to Denmark. The peninsula is intersected by the Kiel Canal which, stretching from the mouth of the Elbe to the bay of Kiel, acts as the shortest sea route between the North and Baltic Seas. Opposite the west coast of Schleswig-Holstein is a group of islands: the North Frisian Isles: Sylt, Föhr, Amrum, among others. Schleswig-Holstein has, like the neighbouring Denmark, most productive pasture lands and accordingly highly-developed dairy-farming; it is first and foremost a farmer's country and more densely populated along its coasts. In the northern part of the peninsula lies the Jutlandish moor and heathland.

Mecklenburg (including the part of the former province of Pomerania on the left bank of the river Oder). The coast of Mecklenburg is indented by many bays and a great part of the population makes a living by fishing. The sea climate is very favourable to the growth of cereals and potatoes. Mecklenburg was, in contrast to the neighbouring Schleswig-Holstein, the domain of the big landowners; it belongs to the most sparsely populated regions of the country. One can walk for hours without meeting a single soul. The wide chain of the Mecklenburg lakes is remarkable for its magnificent scenery.

The former province of Pomerania is divided by the Oder into the fertile Hither Pomerania and the more sparsely populated eastern Pomerania. The Oder was made into the Eastern frontier by the Potsdam Agreement of 1945, so that Eastern Pomerania, the Oder marshes and the wheat fields of Pyritz now

belong to Poland. Pomerania was Germany's granary, and though one found here single farmsteads in greater number than in Mecklenburg, this, too, was pre-eminently a country of big estates. The life of nearly all the towns was governed by the land, for they were essentially market-towns for the rural population.

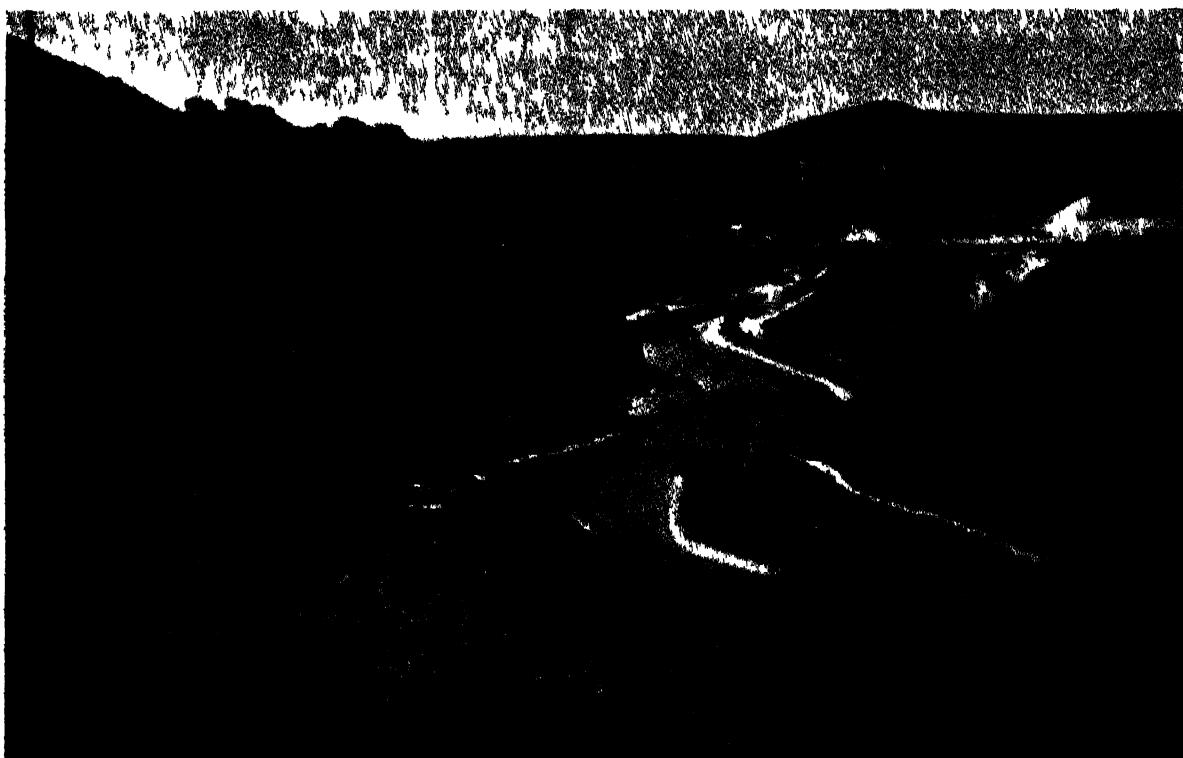
Off the coast of the part of Pomerania now incorporated in Mecklenburg lies Germany's largest island, Rügen. Here are the centres of Germany's Baltic Sea fishing. The island is also famous for its geese.

Brandenburg and Saxony. Brandenburg is another of the former Prussian provinces that lost much territory by the 1945 Polish frontier. It embraces mainly the river-basins of the Oder, the Havel and the Spree; in 1939 it was the biggest Prussian province, but setting apart the urban district of Greater Berlin, which was administered separately, it was one of the most sparsely populated parts of Germany. Here, great landed property once played an important role. The soil is in most places sandy—the "Brandenburg sand-box" yields mainly rye and potatoes, in many places also fruits and

vegetables for the supply of Berlin. A very large part of the province is wooded country, firs predominating.

Certainly one of the most interesting districts in Germany is the Spreewald, situated not far from Berlin, a dense forest traversed by innumerable little arms of the River Spree, which serve as highways even for small distances. The Spreewald is inhabited by Wends, a partly Germanized tribe of the Slavs, who have still kept their old customs and dresses up to this day.

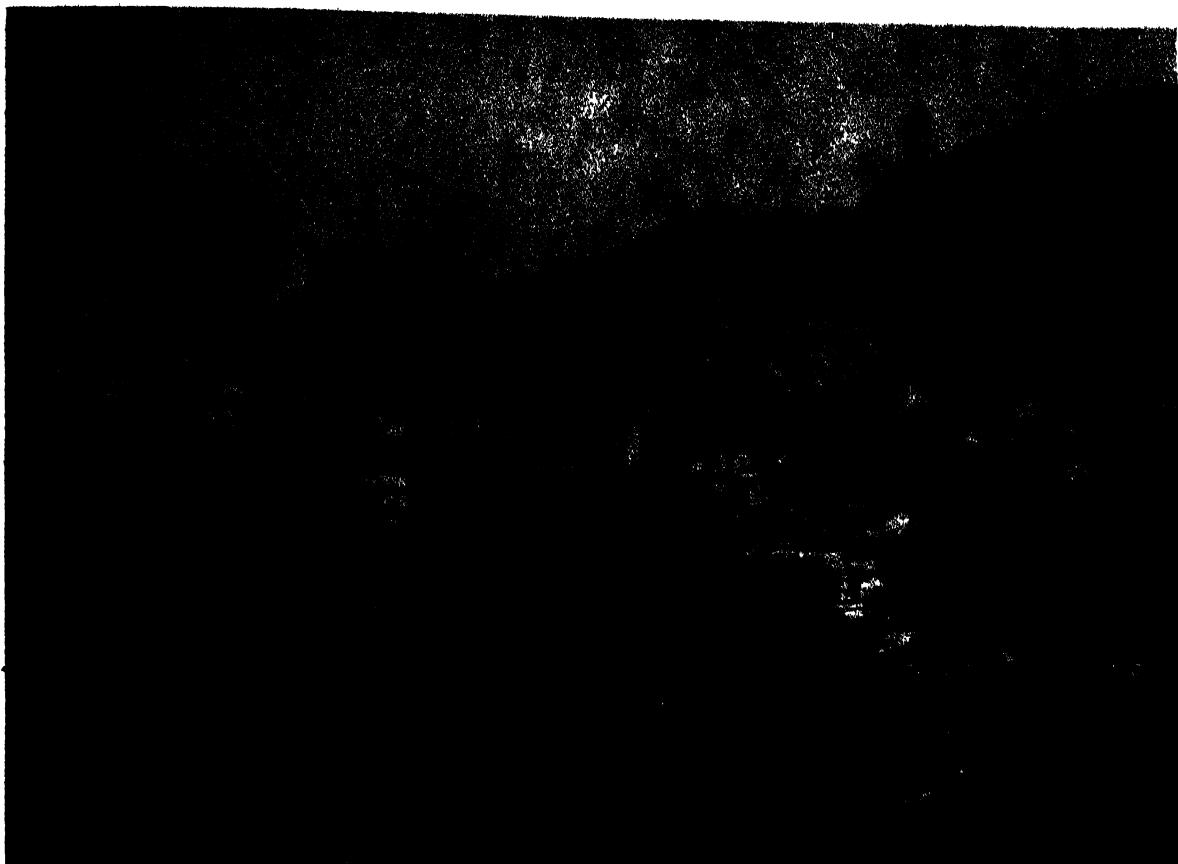
Brandenburg becomes hilly in the south but otherwise it is one of the flattest parts of Germany. More than 600 lakes lend variety to the landscape, Brandenburg being blessed with more waterways, natural and artificial, than any other province. Side by side with agriculture we find busy industries: in parts of the Niederlausitz textile manufacture, brown coal mining, and glass manufacture; in the neighbourhood of the towns of Brandenburg-on-the-Havel, Wittenberg, and Frankfort-on-the-Oder, vehicle and machinery industry, and in Rathenau the centre of the German optical industry.



THE SAAR VALLEY

Hanging woods cloak steep banks—the road and railway seen on the right of the photograph closely follow each bend of the stream

Photo Keystone



BADEN-BADEN

A fashionable watering place, whose springs were known to the Romans
Photo: Picture Post Library

South-east of Brandenburg lies Saxony. Surrounded in the south by the Ore Mountains, the Elbsandstein and Lausitzer Mountains, the country consists, apart from the mountainous parts, of hilly tracts and lowland. It belongs almost completely to the river basin of the Elbe.

The people of the district are Upper Saxons, and speak a dialect which differs widely from those of the surrounding regions. Saxony is one of the most densely populated parts of Germany, with highly developed industries: many factories of medium size and, especially in the less fertile mountain districts, a great deal of home manufacture; toy making in the Ore Mountains, musical instruments and lace in the Vogtland. From Schandau near the Czechoslovakian frontier, down to Pirna near Dresden, the Elbe takes its course through a narrow, canyon-like rocky alley, framed on both sides by the wild, romantic Elbsandstein

Mountains: the "Saxon Switzerland." Dresden lies in the wide Dresdener Gorge, whose mild, sunny climate favours the growth of vines and fruit.

Near Chemnitz, the centre of the German hosiery industry, lies the coal district of Zwickau. In the west of Saxony is Leipzig, situated in the Leipziger lowland, a vast, partly fertile, partly marshy plain. Between Leipzig and Halle we find a district largely characterized by its fertile wheat and sugar-beet fields. The way leads us to the core of central Germany, the former Prussian province of Saxony, which represents a remarkable mixture of highly fertile agricultural, and likewise highly developed industrial regions.

The province of Saxony embraces parts of Thuringia, Brunswick, and the country of Anhalt, and also parts of the Harz. In the east it stretches beyond the Elbe, whose basin is conspicuous for its fertility. The northern part



BAVARIAN SCENES

1. Bavarian youths on the road to a country fair. 2. On the way to a mountain hut. 3. A beer garden
Photos Charles Mougin

of the province comprises great areas of the North German Plain where large estates predominated. In the neighbourhood of Magdeburg are extensive sugar-beet fields. It is one of the chief centres of the German sugar-beet industry. Around Bitterfeld there are rich turnip and wheat fields; near Dessau fir forests and vast heathlands. The Midland Canal connects the province with the Brandenburg net of water-ways. Near Halle are large brown coal districts, likewise in Anhalt which also has very productive potash deposits. Another important brown coal district lies near Bitterfeld, and founded on these coal deposits are large electricity works. Germany's greatest chemical works, the Leuna Works, are also situated in this province. The Mansfelder copper district belongs to the Harz region, though it lies in the province of Saxony; it has one of the few important copper deposits in the country.

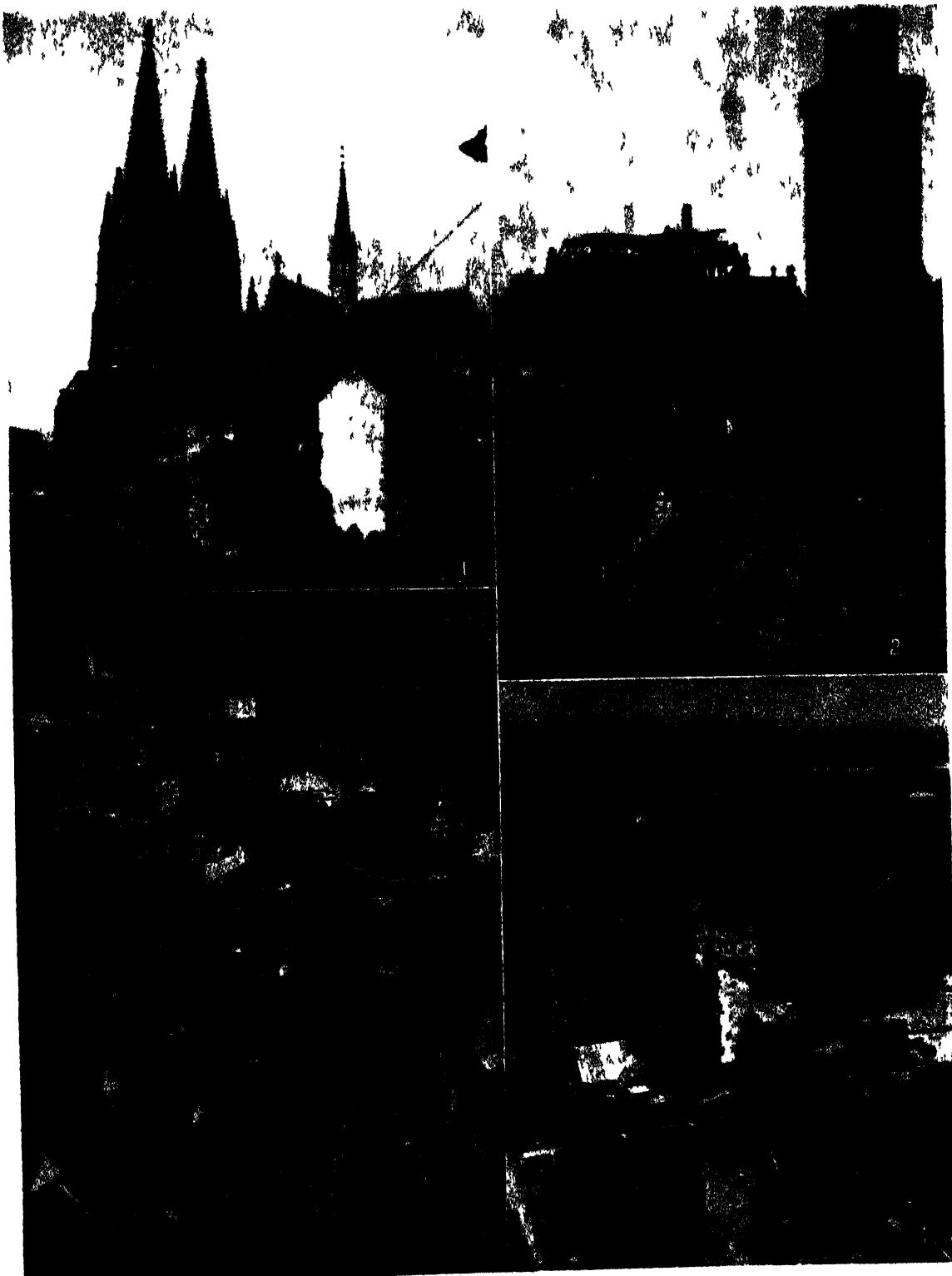
While we find in the agricultural parts often only the thinly populated villages of the former large estates, the mining and industrial parts are densely populated. The workmen frequently live in the country in smaller suburbs and settlements. By origin the people are Upper Saxonian-Thuringian, with a fair admixture of Slav elements.

The Harz and Thuringia. One of the most beautiful and woody regions of Germany is the Harz, the northernmost part of the Central German Mountain Range. For many centuries the Harz was a mining district, chiefly for silver; now its inhabitants live mainly on the forest, as wood-cutters, labourers in the sawmills, and as wood-carvers. The western

Upper Harz, with an average height of 2000 feet, has plenty of rain and mist; it has large, dense fir forests, and lonely villages. Lying to the east, the gently undulating Lower Harz is different, with a wide area of fields and pastures and a milder climate. The Harz, being the mountain district nearest to Berlin, has a number of much frequented health resorts like Wernigerode, Harzburg, and Blankenburg.

Thuringia was, in romantic days gone by, the country of principalities and duchies; to-day it is one uniformly administered province. Situated between the Rivers Saale and Werra, the landscape consists of the fertile Thuringian Basin and the Thuringian Forest, a ridge extending to considerable length. Out of the Valley of the Werra rises the Wartburg Hill, well-known from the times of the Reformation. Beside forestry, the Thuringian Forest is the seat of small iron and steel factories. Home industries are wide-spread among the inhabitants of the mountain villages, especially toy-making. In eastern Thuringia lies the romantic Schwarza Valley; in Lauscha we find a fair-sized glass industry. The mountains harbour valuable ores: near Schmalkalden, iron ores; near Ilmenau, copper, slate, and manganese ores. The ridge is the watershed between the central German Elbe and the west German Weser.

Bavaria. The larger eastern part of southern Germany is occupied by Bavaria; the country extends from the Alpine highland in the south to the Thuringian Forest in the north, from the Bavarian-Bohemian Forest in the east, to the Spessart in the west. The chief region lies east of the Rhine, but a smaller part, the Bavarian



THE HAVOC OF WAR

1. Köln. Though surrounded by a desert of ruins, the late Gothic spires of the Cathedral are almost undamaged 2. Frankfurt. The Zeil with the Haupstrasse in the foreground was once the city's most crowded thoroughfare 3. Hamburg. General view of the city centre.

4. The Rathaus at München

Photos Associated Press, Keystone



HANDICRAFTS

1 A potter at work 2 Making Christmas tree decorations of glass at Iaucha in the Thuringian Forest 3 Painting carved wooden toys 4 Hand-weaving factory in Upper Bavaria 5 A tin worker of Biberach

Photos German State Railways

Palatinate, lies in the lowland of the Upper Rhine. Bavaria is generally divided into the Danube and Main regions; it is predominantly agricultural; only in the north, in Franconia, is industry represented to a greater extent. There are hardly any treasures of the soil, but the country possesses a large amount of utilized water power which in many ways compensates for the absence of coal.

Bavaria is decidedly a farmers' country; cattle are raised especially in the Alpine Foreland and in the north-west, in the mountainous Allgau. The most fertile farming districts are near the Main, in the Palatinate and in Lower Bavaria. Hops are grown in many

places; Germany's largest breweries are in Bavaria. The grape, too, has its place there, particularly in the valley of Lower Franconia and in the Palatinate. Characteristic of the farming districts are big thickly populated villages. Three German races: the Bajuwarians, the Franks, and the Swabians, live in Bavaria, and they speak dialects which differ sharply from those spoken in Saxony and in northern Germany.

Württemburg and Baden. The southwestern part of Germany is occupied by Württemburg and Baden. Württemburg lies between Baden and Bavaria; it extends from the Lake of Constance in the south to the

neighbourhood of the Main in the north. The north-west is mainly the river basin of the Neckar, the south-east that of the Danube. Württemburg is a hilly country: in the south parts of it belong to the German Alpine Foreland; farther to the north lies the Swabian Alb and in the west begins the Black Forest. The valleys of the Neckar basin are abundantly fertile, with many orchards and vineyards; in Upper Swabia we have more cattle-raising. In agriculture small and medium-sized holdings predominate, but the rural population often carries on a trade besides. There are certain highly developed industries, particularly the manufacture of machinery, vehicles, and clocks and watches, but even the factory-hands are often still connected with agriculture. In the south the inhabitants are mostly Alemans, in the north Franks.

To the west of Württemburg lies the narrow, long-stretched country of Baden, confined by the Rhine and Black Forest; bordered by the Lake of Constance and Switzerland in the south and the Main in the north. Approximate-

mately three-quarters of the big south-west German mountain range, the Black Forest, belong to Baden. The inhabitants, chiefly Alemans, derive their living from stock-farming and in the more densely-wooded parts from forestry and wood-carving. The level part of Baden lies in its greater part in the exceedingly fertile lowland of the Upper Rhine, wheat, fruits, wine and hops are the chief products, but also tobacco grows well in the mild sunny climate. Baden is the most important tobacco growing district in Germany. Chief centres of industry are Karlsruhe and Mannheim, the university towns of Heidelberg and Freiburg are internationally famous.

Hesse and Westphalia. Partly situated in the lowland of the Upper Rhine lies the country of Hesse, on both sides of the Rhine between Worms and Bingen.

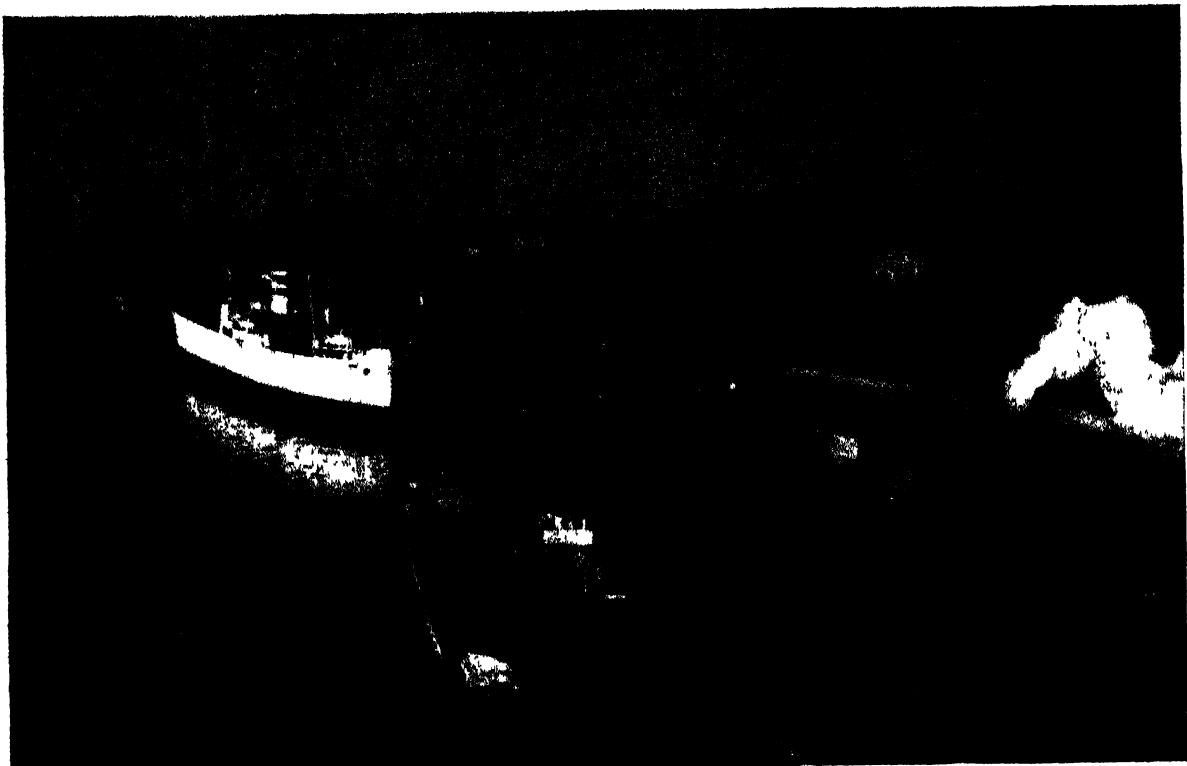
In the south of Hesse are the Odenwald and the very fertile "Bergstrasse" district, with a great deal of fruit and early vegetable growing. In the north are the Vogelsberg and the Valley



THE VINTAGE

Grape pickers in a vineyard overlooking the Rhine

Photo: Plant



GERMAN RECOVERY

The overseas dock at Bremen is almost back to pre-war conditions. In 1945 the port had not one single quay undamaged
Photo: Associated Press

of the Lahn. In the north-east in the Taunus region lies the world-renowned spa Nauheim. The country is densely populated; in agriculture the small peasant's holding predominates. Important industrial centres are Darmstadt, Mainz and Offenbach, with leather, machinery and fancy goods industries. Hessian country includes also the former Prussian province of Hessen-Nassau, with the important commercial centre of Frankfort-on-Main. The province is mainly hilly: Taunus, Westerwald, and Hessian mountain country. Over 40 per cent of the area is forest.

North of Hesse, between the Weser and the Rhine, extends the former Prussian province of Westphalia, which borders on Holland in the north-west. We have made the round of Germany, and thus come back to the region of the North German Plain, though considerable parts of Westphalia are still mountainous: in the north the Weser Mountains, in the east the Egge Mountains, in the south the Sauerland, with the Lenne Mountains and the plateau of Winterberg. In the north-west lies the fertile lowland basin of Münster, with its many heaths and peat-bogs. In the east is the hilly country of Paderborn.

Though Westphalia belongs to the great west German industrial provinces, it is in many parts a farming country. Its fertile soil, the "Red Earth," favours agriculture and stock-farming; small and medium-sized holdings predominate. Apart from that, Westphalia possesses valuable treasures of the soil, especially coal, which have come to form the basis of the Rhenish-Westphalian industrial region. Here big industrial cities like Bochum, Gelsenkirchen, Dortmund, and others have developed from villages in the course of a few decades. South of the Ruhr lie the Sauerland and the Siegerland, well-wooded districts with a highly developed iron industry. The population is partly Lower Saxon and partly Lower Franconian.

Between the Rivers Ruhr and Lippe lies the Rhenish-Westphalian industrial district, in the narrower sense also called Ruhr District, the largest industrial centre on the Continent. Here live about 10 per cent of Germany's inhabitants. On its rich coal deposits has developed a great part of the German heavy industries. Besides the industrial towns already mentioned we find here Hamborn, Essen, and Duisburg-Ruhrort, the latter being Europe's

biggest inland port. Iron ores and other raw materials come from the North Sea via water highways and the Rhine to the Ruhr District, and the ships return laden with coal and finished goods. A part of the population derives its living from inland navigation. A large area of the Ruhr District lies not in Westphalia but extends into the former Prussian Rhine Province, and thus we come to the internationally best known part of Germany, the Rhineland.

Rhineland Palatinate. This province includes the districts of Koblenz and Trier of the former Prussian Rhine Province, which bordered on France, Luxembourg, Belgium, and Holland. In the larger southern part it is mountainous (Rhenish Slate Mountains), in the north plain with the lowland basin of Köln. Agriculture is carried on in the fertile lowland; on the Rhine and Moselle we find orchards and vineyards. In the Eifel, Westerwald, and in the Bergische Land, there are extensive forests.

Beside the heavy industries of the Ruhr District, the Rhineland is the seat of many other branches of industry: paper manufacture and chemical industries in Leverkusen, and textile industries in Aachen. Of Germany's fifty-five big towns, twelve lie in the populous Rhineland. The population is mainly of Franconian origin.

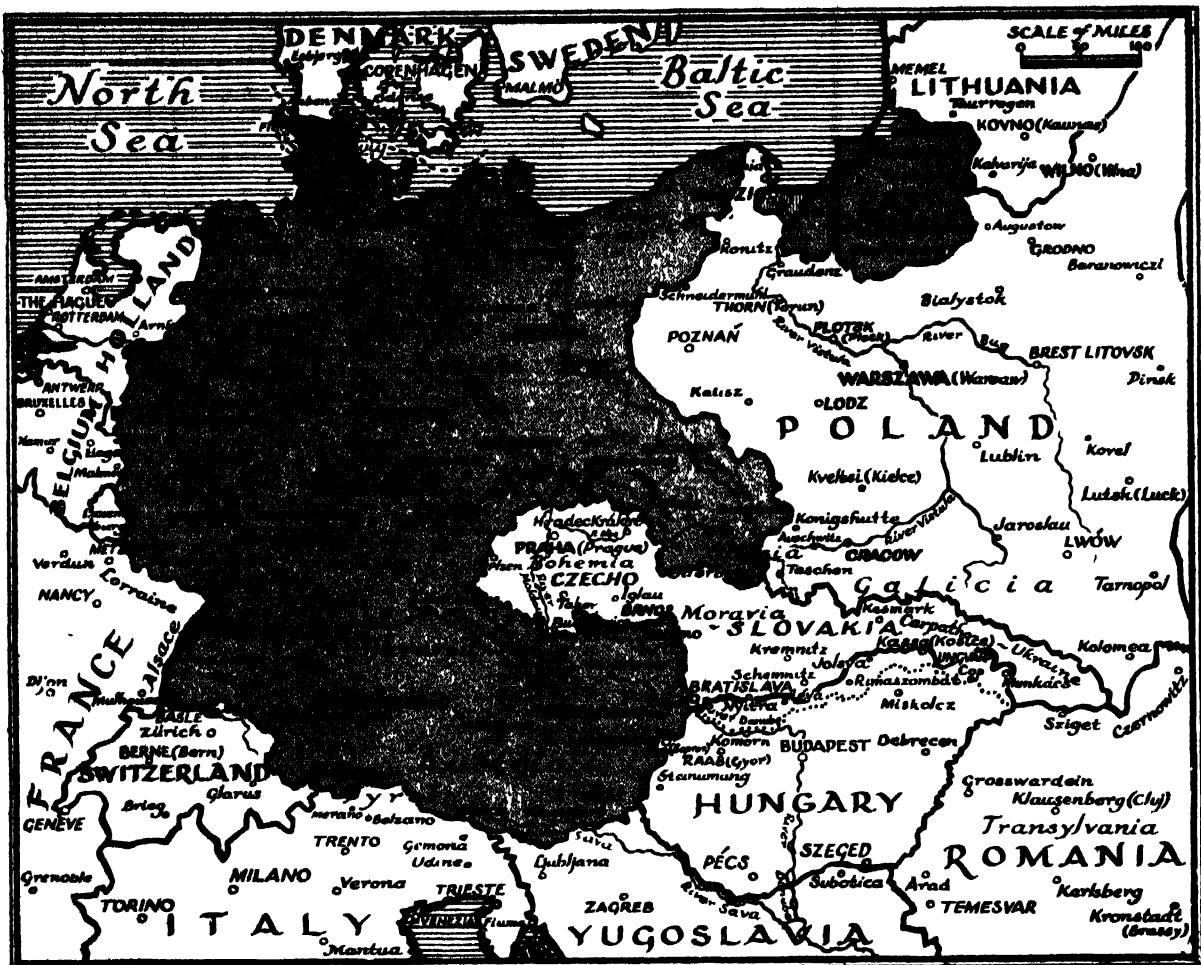
In the south-western corner of the Rhineland, between the Bavarian Palatinate and France, lies the Saar Basin, which formerly belonged almost entirely to the Rhine Province. In 1935 it was taken over by Germany and was made a special province. In October 1947, however, the Saarland voted for political independence from Germany and economic attachment to France while remaining a democratic and autonomous state. It is an area rich in mineral deposits and with many highly developed industries. It has been a bone of contention between France and Germany for many years.

The Resources and Industries of Germany

THE development and stupendous growth of Germany's wealth and economic fabric until 1945, seriously interrupted by the first World War, can in no way be compared with that of England. This sea-girt country with the most stable of all governments has, since 1688, not been exposed to any serious revolution, and, splendidly isolated, has not experienced foreign invasions since time immemorial. Completely different are the conditions in Germany; her position in the very centre of Middle Europe made her, not to mention the wars she waged herself, for centuries the battlefield of continental campaigns. Provinces were annexed and others surrendered; within 150 years she has now been three times, in 1806, 1918 and 1945, politically and financially ruined. Germany's mercantile and industrial activities and, as a result of both, her economic position and wealth, can, therefore, only be described from an historical point of view and to a much greater extent than in any other country the whole development depended upon the battles she won or lost. The evolution, which after centuries of want and privations, at last came about, was not achieved in a steady flow; it extended over exactly forty-three years, starting with the end of the war against France in 1871, and ending with the commencement of the first World War.

In the first decade of the nineteenth century the country was scarcely commercialized and not at all industrialized; it emerged from the Napoleonic wars in a state of utter exhaustion and a considerable time had to elapse before it could recover to meet the capital demand involved by the advent of machinery; besides, technical improvements were of little use as long as Germany was cut up into more than sixty autonomous territories, each of which had a separately organized standard of coinage and economic life. Almost medieval economic conditions were still in existence. Of a population of 10,000,000 (in 1800), only 27·5 per cent lived in towns, and even there a considerable number made their living through agriculture and cattle raising. Only one town counted more than 100,000 inhabitants, and that was built on the arid sandy soil of the Mark Brandenburg, Berlin—with a population of 150,000. In those days England was in the midst of her industrialization and London, with 900,000 inhabitants, was fast developing into a magnificent international metropolis.

The foundation of Germany's new economic life and system was laid when the old Empire was destroyed, in 1806, by Napoleon, who, as a recent writer has remarked, "did more for the political and economic unification of Germany than anybody, Bismarck included."



GERMANY, 1939

The boundaries of Germany, Poland and Hungary, prior to the revisions of the Czechoslovak frontiers in 1938 are indicated by dotted lines.
A map of Germany before the inclusion in the Reich of Österreich (Austria) appears on page 192.

This may sound paradoxical, but it is true; from that time dates the modern Germany. During the three decades of undisturbed peace, from 1815 till 1848, the inhabitants were granted some breathing space, and in 1834, in the absence of national unity, which was not to come before 1871, a Customs Union (Zoll Verein) was formed. The population now was in a position to think of developing trade and agriculture and of the exploitation of the natural wealth.

Natural Resources. Compared with France, Russia, the U.S.A., and some South American States, Germany—apart from lignite, potash, and some iron ores—is by no means rich in natural resources, and such as exist are very unequally spread over the country. As every industry located itself where the most favourable conditions seemed to exist and, as coal is heavy and bulky, this was preferably

as closely as possible to the pits, the industrial centres are concentrated in the south and west, the agricultural east locking them altogether.

It was a long time before use was made of the extensive coal-fields in the Saar, in Silesia and along the banks of the Ruhr. The most important, that in the Ruhr, now the pillar of the Rhenish industry, was not touched before 1815, and effective working was delayed until the middle 'seventies. Silesia, where the coal mines were in the hands of big magnates, long unwilling to industrialize inherited feudal property, was still more behind the times, and the output was not started until after 1840. At that time, London alone consumed more coal than the whole of Germany could raise. All these delays, however, were more than made good in the years of the enormous industrial rise, and coal, exported almost all over the

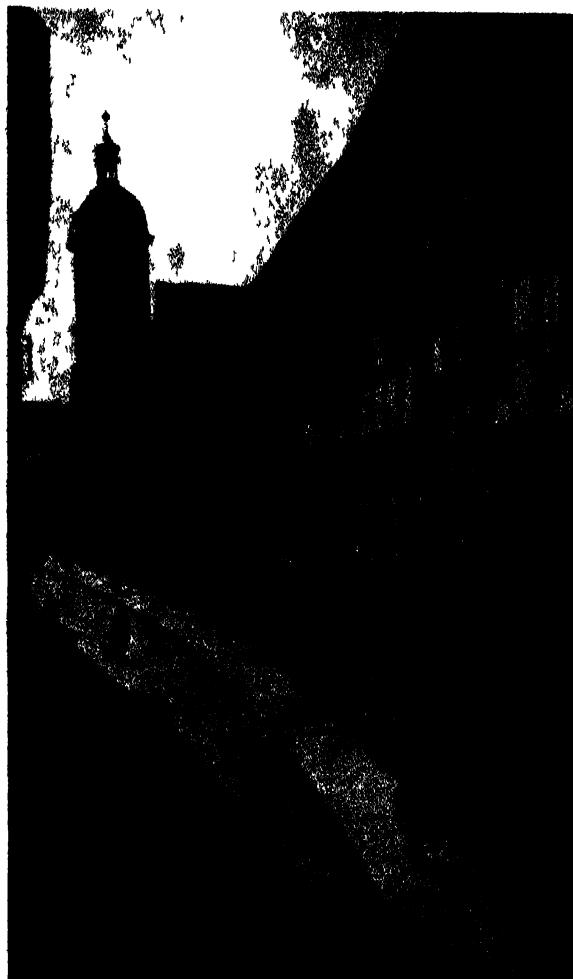
world, became the chief contributor to Germany's wealth.

Though there is no steam coal to equal that mined in South Wales, this drawback is offset by the large and almost unique deposits of lignite (brown coal) found in central Germany, the Saxon states, and the Rhineland, which can be cheaply worked as it is close to the surface. From 1871 to 1914 lignite production increased tenfold, and was again largely extended before the second World War. Owing to the economic necessity of saving hard coal, important parts of Silesia having been lost to the Reich, lignite became the supplier to many branches of industry not accustomed to this kind of fuel, and was made the basis for the production of synthetic nitrate (an important fertilizer) and used as a cheap raw material for producing oil. Power plants near Bitterfeld in the lignite area of central Germany are now generating the electric power for Berlin, where in 1906, 20 per cent of the coal burnt was still British.

Situation of Industries. The industrial position of a country and its wealth are largely dependent on the possession of coal and iron ore mines, and it can be truly said that the new Empire was built in reality more on "coal and iron" than, according to Bismarck's dictum, on "blood and iron"; Germany's iron industry developed into a position of commanding pre-eminence, indeed into by far the largest in Europe, and produced more than she could consume. It is one of the great national assets of Germany that the pits of both these important natural resources are not far away from each other, that they are situated near navigable rivers and canals and that the industries are locally concentrated with the definite advantage of providing an incentive towards centralization, which always acts as a stimulus to do away with competition.

The metal industry is centred in Rhenish-Westphalian towns like Essen (Krupp Works), Bochum (Union), Gelsenkirchen, and in Magdeburg (Krupp), the last not far away from the lignite deposits. Iron and steel wares are manufactured in Remscheid and especially in Solingen—which is the German equivalent of our Sheffield—woollens in Saxony, Brandenburg, Thuringia, and the Rhineland; cotton goods in Saxony, Westphalia, and Württemburg.

In the mountain districts of central Germany the old handicraft system is by no means



A FILM TOWN

The most modern film studios of Western Germany are now situated in a suburb of Goettingen

Photo Keystone

completely extinct; in the Riesen Gebirge the weaver's trade, and in the Erz Gebirge the manufacture of laces, wooden wares (especially wooden toys) and musical instruments, survive. Glass and china are still produced in small-scale establishments in Franconia and Thuringia, and watchmaking in the Schwarzwald (Black Forest) has retained its old-established fame.

In the south of Germany, Stuttgart—textiles, machines, chemicals, leather goods—Pforzheim with its world-wide reputation for the manufacture of jewellery and trinkets; Mannheim—tobacco and machines—and München (Munich), with its breweries, have developed into big industrial centres. The ancient glory of Frankfort-on-Main, famous for its fairs and big banks, including the original House of

Rothschild; Augsburg, where the Fuggers, the richest family on the Continent in the Middle Ages, resided; and Nuremberg, with its toy industry and hop-exchange, have vanished and are now things of the past. Berlin—in particular the seat of the big electrical and highly-developed machine factories, whose products are famous for their excellent quality, and are widely exported—long ago took the lead and, until 1871 the capital of Prussia only,

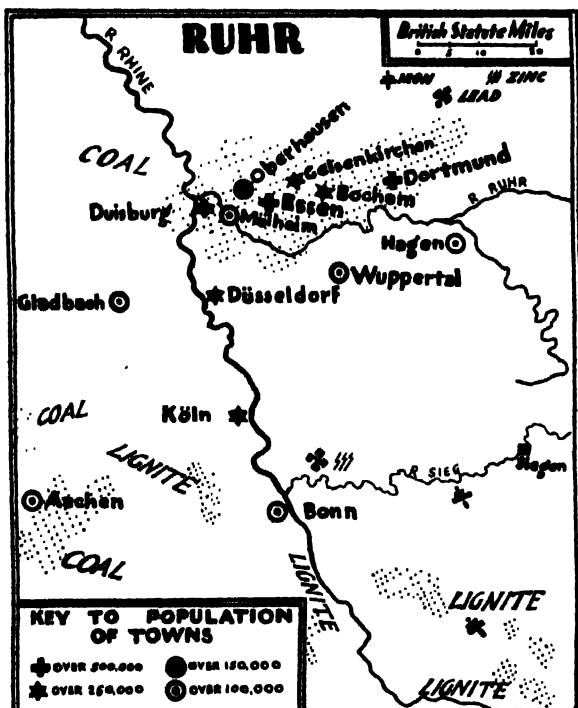
cent of the country was under the plough and about 27 per cent was covered by forest. These forests have been a substantial part of the country's assets and basis of a flourishing wood and wood-products industry. Forestry consequently is of great importance and it is conducted on scientific methods under supervision of the State.

Growth of Communications. Under the conditions prevalent in Germany at the beginning of the nineteenth century, the first railway could well delay its appearance until exactly ten years after the inauguration, in 1825, of the world's first railway between Stockton and Darlington. A line connecting the two Bavarian towns of Nuremberg and Fuerth (a distance of three and three-quarter miles) was at last opened in 1835; progress was so slow that twenty years later, in 1855, only 4870 miles of railway had been constructed, so that the annual increase amounted to barely 243 miles. At this time in England, with her smaller area of 95,030 square miles against 181,699 square miles—6600 miles of railway were in operation.

In a backward and undeveloped country the influence of railways was bound to be revolutionary; they dragged the nation from her economic stagnation and laid the basis for her industrial transformation: most of the large undertakings in the Rhineland, in Westphalia and Silesia, which by about 1900 had assumed gigantic dimensions, were then formed.

In 1939 the railway system of Germany exceeded that of any other European country and comprised 40,431 miles (against 20,000 in Great Britain). In addition to this most valuable national asset, 8000 miles of navigable water highways (of which 1380 miles are canals) and the world's largest inland port, Duisburg-Ruhrort, are at the disposal of Germany's industry and trade. Of all the big rivers, however, the Weser only has the whole of its course in Germany.

With the advent of railways the wealth of Germany slowly increased; not much, however, is on record of pre-Imperial commercial enterprise. Craftsmen for a long time remained half peasants and iron-making a peasant's by-industry. Ancient iron industries were carried along the lines of handicraft works, and in the Siegerland and the Harz, where iron and copper ores are found, many small metal working establishments survive to this day.



it is now the centre of all industrial and commercial activity.

The Former Prussian Estates. The eastern parts of the former area of Prussia are still mainly agricultural; in East Prussia and Silesia were situated the large manorial estates on which well into the last century most of the peasantry lived as hereditary subjects of the owners in their villages, bound to fulfil a number of duties for their lords. In the much wealthier west and south small estates and peasant proprietorship prevailed.

Fundamental changes have taken place since the middle of the nineteenth century. The use of new methods of fertilization (of which more in the course of this article) have greatly increased the produce of the land, and before the first World War Germany exceeded, under very poor conditions, all countries in respect of the yield per hectare. In 1939 about 42 per

Industry on an English Model. When industrialization began, the Rhineland taking the lead, Great Britain was the model and the regularity, the quiet and business-like arrangements, were quite English. The steam-hammer used in 1846 at Oberhausen was of James Nasmyth's invention and it is said that the first good steel that Krupps made was often sold as English. Nor should it be forgotten that the railway lines adopted Stephenson's English gauge and that Albrecht Thaer, by basing his studies on English rural industries, brought German cultivation to prosperity. The disadvantage that the extensive deposits of iron ore mostly contained phosphorus turned into a boon when German iron could be dephosphorized by the Englishman Gilchrist Thomas's invention; the new process, moreover, yielded the so-called Thomas slag, a material for an excellent artificial fertilizer, which freed the country from the necessity of importing guano and nitrate and to an enormous extent helped to increase, under adverse conditions, the yield of German agriculture.

The Rush to the Towns. The transformation into an industrial state became rapid and Germany's heyday began in 1871; until then, not much more than "a geographical expression," the national unity, the new Empire, came into being after a victorious war, and France was forced to send £200,000,000 sterling into a comparatively poor country. Hitherto Germany had barely been in a position to supply her home industries with sufficient means, and every undertaking, even Krupps, was hampered by a constant shortage of capital. This gigantic sum cried aloud for investment; redeemable loans were repaid; the era of nationalization of the railways was soon to dawn, and what was much more, new working capital stood at the disposal of trade and commerce and all forces tended towards indus-



PRE-WAR PHOTOGRAPH OF THE RUHR BY NIGHT

One of the great iron foundries of the Ruhr Valley illuminated by scores of blast furnaces

Photo German State Railways

trialization and urbanization. The rural population, still 63·9 per cent in 1871, had declined to 57·5 in 1890, and to 40 per cent in 1910, figures which indeed suggested a whole nation rushing to town, into industrial undertakings.

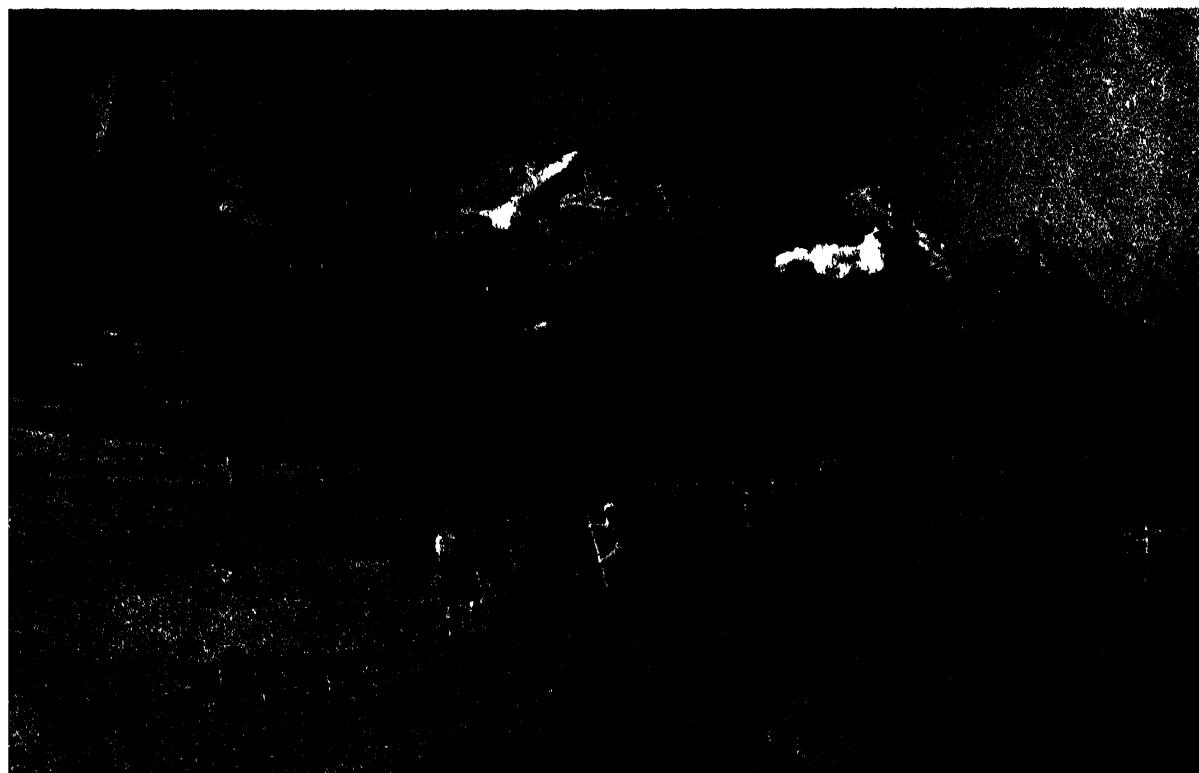
In order to be able to carry the increased production under her own flag to the markets overseas, ships were built, and to finance the new industrial fabric, banks were founded at home and abroad with the aim of facilitating commercial relations between Germany and the other European and overseas countries.

As late as 1876 the Commissioner sent by the Government to the World Exhibition in Philadelphia himself described the German goods as "cheap and nasty"; by the end of

the century, however, the youthful spirit of enterprise had succeeded and the designation "Made in Germany" had become a recommendation. In less than forty years the coal production had increased by 218 per cent (England 72·6 per cent), the foreign trade by 225 per cent (England 112 per cent), the Merchant Navy by 250 per cent (England 185 per cent), and Germany had become politically at first, and afterwards industrially, a world state and a creditor instead of a debtor

than natural resources were the foundation of Germany's wealth. Scholars accomplished amazing results in all departments, not only confining themselves to pure science, but converting themselves into creative workers, and this activity it was that achieved such enormous and stupendous successes.

The Electrical Industry. On these lines the electrical industry, the greatest single achievement of modern Germany, was created and expanded, and German electrical factories

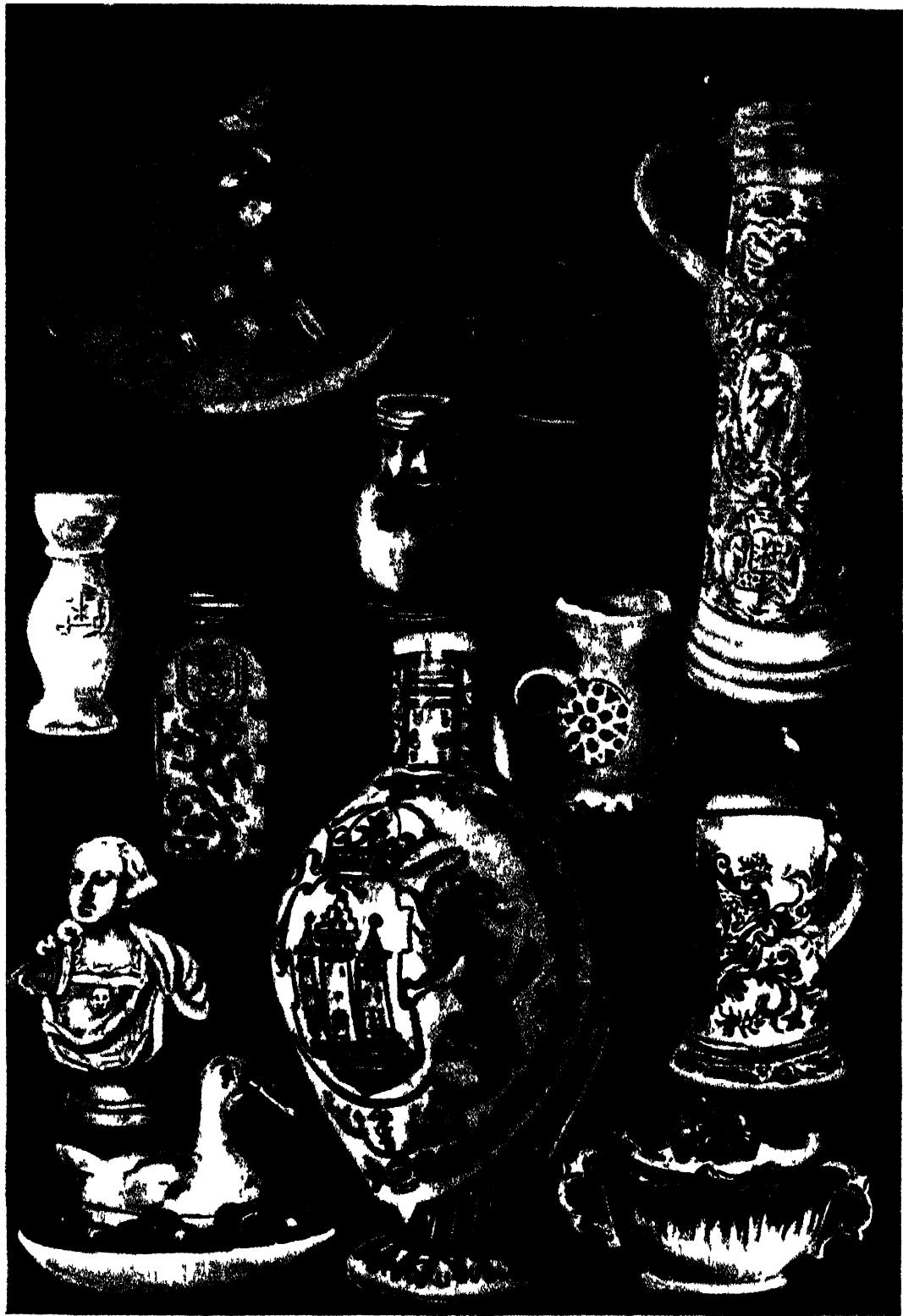


UPLAND PASTURES
Haymaking in the Bavarian Alps
Photo German State Railways

nation. At this stage, however, she touched upon dangerous ground, as, even in the days of her greatest prosperity, she was not wealthy enough to afford to export capital and this unhealthy imperialism was one of the reasons for her later downfall.

The astounding fundamental transformation was all the more remarkable as the country did not produce sufficient breadstuffs or other foods and clothing to meet the requirements of a population which had increased at such a high speed, for the rise from 10,000,000 in 1800 to 68,000,000 in 1950 was indeed phenomenal. Invention and scientific management rather

became the forerunners among their European competitors. This marvellous development must be associated with two names, that of Werner von Siemens, a scientific pioneer, who invented the dynamo and founded the Siemens and Halske concern, and that of Emil Rathenau, financially the most important exploiter of the new industry; he formed the first large electrical business in Germany, which under his and his son Walter's guidance, expanded into the A.E.G. (Allgemeine Electricitaets Gesellschaft). Both combines grew to be international powers, helped to solve the problem of procuring nitrogen from the air by electrical



GERMAN POTTERY

1 Samson and Delilah shallow bowl made in southern Germany in 1526 2 Jug with an oak-leaf motif made in the Maximinenstrasse Kölñ (Cologne) about 1540 3 "Greybeard" (Bartman) made in Kölñ in the sixteenth century 4 "Mars Schnelle" made at the workshop of Anno Knutgen in Siegburg in 1580 5 Breaker with Massweikrose dating from the early sixteenth century 6 White breaker with funnel neck made at Siegburg about 1600 7 Grey and blue stoneware from Westerwald (seventeenth century) 8 Jug with the arms of the city of Hamburg made in that city in the seventeenth century 9 Bust in white faience from Ludwigsburg dating from about 1735 10 Tankard, ascribed to the city of Hamburg, from Oettingen, dating from about 1750 11 Covered dish in the form of a duck, from the Chely factory, Brunswick, about 1750 12 Small tureen with green shell border and coloured flowers from Revel, about 1770

methods, and together with the I.G. Farben (see below), built up the Leuna Werke near Merseburg, right in the centre of the lignite district, for the production of nitrogen and fertilizers.

The Chemical Industry. The chemical industry—domiciled in the Rhinelands, Saxony and Baden—also had a singularly rapid development, and notwithstanding the fact that England was the real home of chemistry, it obtained almost a world monopoly in some

potash deposits. Work began on these deposits on a small scale in 1860; by about 1900 the output had grown to such an extent that potash salt, a fertilizer of prominent importance, of which the country itself was a large consumer, had become one of the chief articles for export, helping greatly to strengthen and maintain Germany's commanding position in the world's markets.

The Textile Industry. In contrast to the chemical industry, the textile industry was of



THE HUGE KRUPPS WAR PLANT AT ESSEN IN THE RUHR BEING DISMANTLED AFTER THE SECOND WORLD WAR
Photo Associated Press

branches of its products. Although the 1914–18 War was a big setback, the industry soon returned to outstanding importance. In 1925 the I.G. Farben Industrie was formed, which developed into the largest chemical combine in the world. Under the Nazis it was used as a powerful economic and political weapon, and as a framework for espionage on a grand scale, as well as being of vital importance to their war machine. The combine was broken up by the Allies in 1947.

The rise of the chemical industry was due to the inestimable advantage that practically all the essential raw materials stood abundantly at its disposal in the domestic coal-fields and

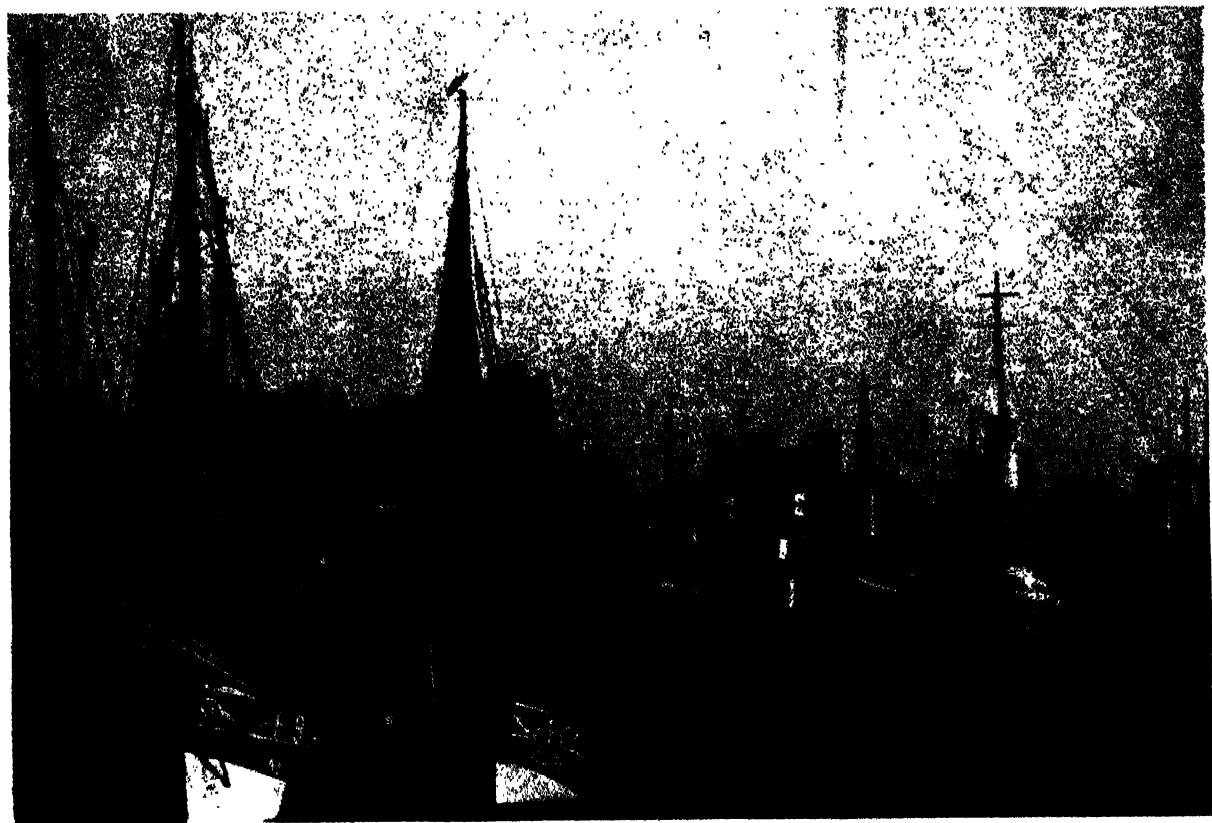
older standing; until far into the nineteenth century all over Germany the peasants grew flax, and in the east and in Silesia there were whole villages of spinners, existing under terrible conditions. In the 'fifties and 'sixties the cotton industry expanded quickly in Saxony and Elberfeld; minor centres arose in Bavaria, Württemberg, and Silesia, and in 1871 the great Alsatian industry could be added.

Artificial silk (rayon) had an enormous development and centred mainly in and around Krefeld; both here and in München-Gladbach, sometimes styled "the German Manchester," a highly efficient textile industry was set up, which in the whole of Germany

gave employment to a far larger number of persons than any other branch: the value of its exports was greater than that of any other industry. But even then the export surplus of finished goods was not sufficient to counter the costs of importing raw materials and yarns.

Between the two World Wars. The 1914-18 War, followed by the Treaty of Versailles, brought upon Germany one of the

abroad, estimated at between 20,000,000,000 and 25,000,000,000 marks. After the war her embarrassments were greatly aggravated by the loss of 25 per cent of her wealth in coal and 75 per cent of her iron ore, or probably more, as the remaining ore iron was of low grade. Instead of being able to export her surplus she was now forced to import for the most urgent needs in the reconstruction of the country. Thus it came about that, to give one instance



HAMBURG
A view of the harbour
Photo: Keystone

greatest catastrophes known in the history of economics. The surrender of eastern Upper Silesia, and the temporary abandonment of the Saar Basin robbed Germany of her most important coal mines; the cession of Alsace-Lorraine to France made her lose her unique monopoly in potash, and the iron-ore fields in Lorraine, the most important in Europe, on which her iron and steel industry largely depended.

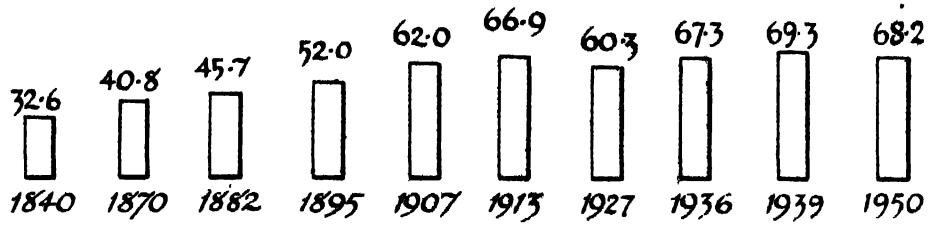
Already before that war, Germany had to deal with an unfavourable balance of commerce, but was able to compensate this deficiency by falling back on her investments

in many, Germany's production of iron-ore, from as much as 36,000,000 tons (world production 185,000,000 tons), in 1913, had dropped to 6,300,000 tons in 1929, and eventually, in times of economic pressure in 1932, to 1,300,000 tons.

Inflation ruined the banks, whose assets from 18,000,000,000 marks gold at the end of 1913 had narrowed to 3,500,000,000 marks gold by the end of 1923; debts could not be, and indeed never were, repaid, as the borrowed money was spent with disappointing results on trying to make cultivation more intensive.

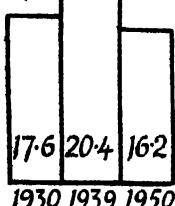
GERMANY

Changes in POPULATION in millions

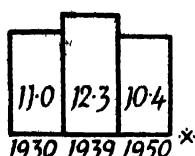


VITAL STATISTICS

Births
per 1,000



Deaths
per 1,000



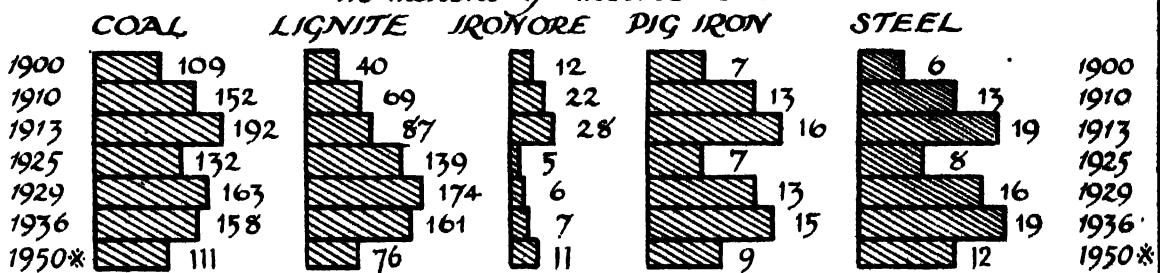
OCCUPATIONAL DISTRIBUTION

in percentages of total
number of persons
gainfully employed



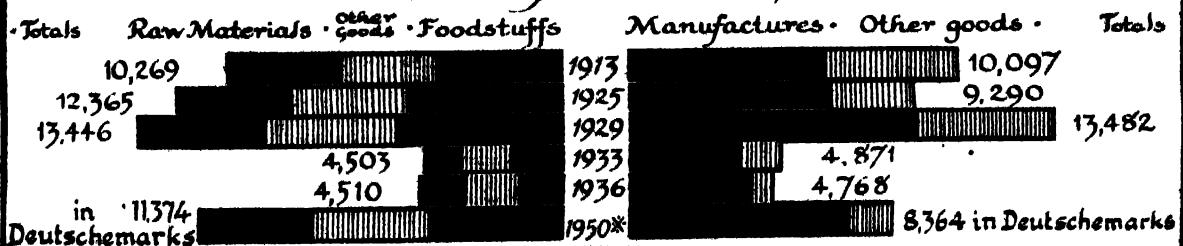
MINERAL & INDUSTRIAL PRODUCTION

in millions of metric tons



IMPORTS

in millions of Reichsmarks/Deutschmarks



EXPORTS

LIVESTOCK

in millions

1936	Cattle	20.0	Pigs	25.8	Sheep	4.3
1950*	"	11.1	"	11.9	"	12.0

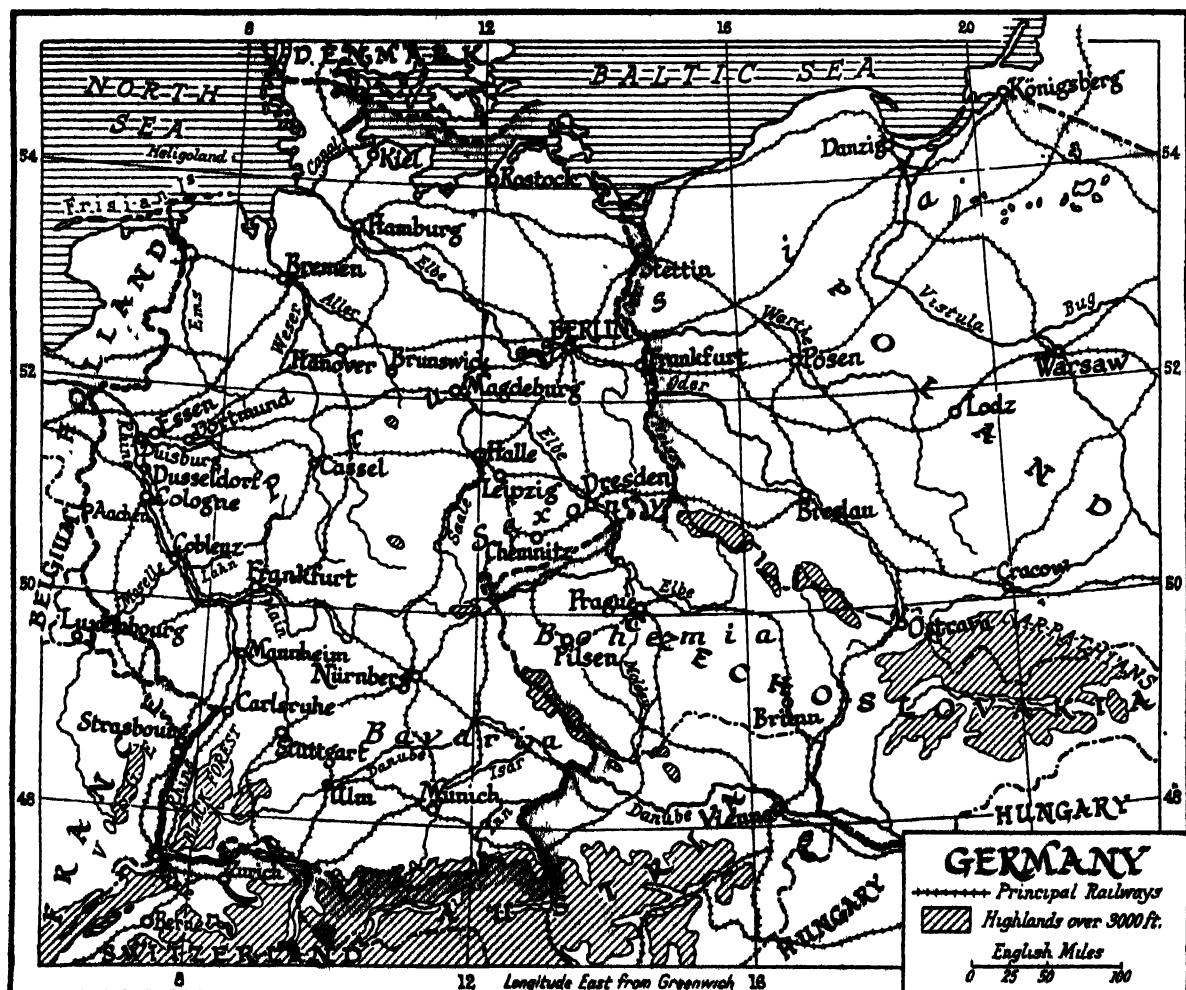
* W. Germany only

Political unrest and fearful unemployment (reaching 7,000,000), symptoms and consequences of the unexampled downfall, completed the decimation of Germany's diligently built-up wealth, which had been estimated in 1913 at 4600 marks (the mark equalled one shilling) per head (against 5500 marks per head in England).

Almost incredibly Germany began to recover. In 1933 the Nazis formed their first government, consolidated their power by destroying all opposition and brought the entire state under single-party control. By 1934 Hitler was the supreme ruler and Germany again started to defy Europe. Economically the difficulties were still immense although there were many of the

ablest economists of the age serving under the Nazis. Even by 1939 the economic problem had not been solved despite a "Four Year Plan" for development of industry and exports, strict economy at home, and the seizure of Jewish wealth. The national debt then was 39,749,000,000 marks, while foreign debts outstanding, against the chief creditors only, totalled about 18,099,000,000 marks.

Had Germany won the 1939-45 War she would have repudiated her debts. As it was, the Allies in 1945 were faced with a ruined country with debts and reparations due, the payment of which demanded an efficient industry, which itself had to be financed with Allied capital.



POST-WAR GERMANY

This map shows the frontiers of Germany after the second World War, and should be compared with the maps on pages 192 and 208

German Cities

GERMANY, unlike England and France, has never had one city of preponderant importance, for, like Italy, she did not gain political unity until very late, and this is reflected in the diffusion of political power and cultural influence among numerous towns.

The towns became independent political organizations which formed leagues among themselves; of these the most important was the Hansa League, dating from the thirteenth century, which at the time of its greatest power included upwards of eighty towns. The great wealth which the towns enjoyed was due to the concentration of all trade and industry within them, a state which continued until the nineteenth century. The artisans were organized into guilds, which exerted a powerful influence on the city politics. As the territorial princes increased in strength, however, the power of the towns declined. Their political independence disappeared and only three were able to maintain their status as independent city-republics, Hamburg, Bremen and Lübeck.

Berlin. The capital is situated on the River Spree, not far from the point where the Spree joins the Havel. It lies in the midst of the plain of northern Germany, but notwithstanding its distance from the sea, an elaborate system of rivers and canals enables it to rank as a port and act as a depot for merchandize coming from the east.

The surroundings of the city are often considered dull, probably on account of the flatness of the country, but there is considerable charm in the fir woods, which thrive in the unfertile sandy soil, and unsurpassed opportunity for water sports on the lakes around.

Berlin only comparatively recently attained national importance. The present city developed from two small towns, Cölln (not to be confused with Köln) and Berlin, both founded about 1230. Berlin was first mentioned in records in 1244, when it joined the Hansa League. In the fifteenth century Berlin lost its independence and became the residence of the Princes of Brandenburg. The very loss, however, was later turned to gain, for it was as the residence of the Hohenzollerns that the city became a natural centre of German politics. The importance increased with the rise of Prussia in the eighteenth century, and in the time of Frederick the Great Berlin began to

take on something of a metropolitan character. From 1806 to 1808 Berlin was occupied by the French. Again the loss of independence was the occasion for the rise to greater power, for Berlin became the centre of the national rejuvenation in opposition to Napoleon. It was in this period, in 1810, that the university was founded. After 1871 Berlin became the capital of the German Empire.

It is significant of Berlin's late development that there is practically no medieval building remaining with the exception of a few churches such as the Nicolai and the Marien. The first great architectural movement which left an enduring impression was the Baroque; the Castle, for example, was rebuilt in that style by the first Prussian king, between 1698 and 1706. In the same period the Zeughaus, a museum for weapons was also built; like the Opera House, which was built about fifty years later, it shows the influence of the Rococo style. The architectural form which most characterizes Berlin, however, was the somewhat severe imitation of the Classical style of the Renaissance buildings. Hedwigs Church, for example, was modelled after the Pantheon in Roma. The Brandenburg Gate, one of the landmarks of Berlin, was built between 1788 and 1791 with quadriga by Schadow. The most famous architect of this period was Schinkel, who built Neue Wache (a famous sentry house), the Royal Theatre, the museum for antiques and the memorial for Queen Louise. The famous statue of Frederick the Great by Rauch also belongs to this period. In the nineteenth century the mixture of styles grew more involved and buildings like the National Gallery, the Emperor Frederick Museum and the Emperor William Memorial Church have met with much criticism. The best work of this period, perhaps, is the Reichstag building, erected between 1894 and 1899 by Wallot after the style of the Italian Renaissance; part of the inside was burnt out in 1933.

After the war Berlin found itself in a state of chaos, having been heavily and repeatedly bombed throughout the 1939-45 War and having had the fighting brought to its very gates by the Russian armies. (For the effects of the splitting up of the administration of the city see page 450.)

The most beautiful street, the famous Unter den Linden, which leads from the Brandenburg Gate to the Castle, has been sadly disfigured by the loss of its lime trees. The biggest park, the Tiergarten, has been divided into vegetable plots and none of the trees remain. Grunewald, a district of fir wood, has for the Berliner the same value as Hampstead Heath for the Londoner. Another large green

is situated on both banks of the River Weser. It is the commercial centre of north-west Germany and ranks as the second most important German port.

As early as 788 Bremen was the seat of a bishop and in 845 it became an archbishopric. In the middle of the thirteenth century Bremen joined the Hansa League. In 1646, it was granted the status of a Free City. The most



PRESENT-DAY BREMEN

View of the main square. On the left is the City Hall, completed over 500 years ago

Photo Associated Press

expanse, the Tempelhofer Feld, is now an aerodrome. The Zoological Gardens are in the centre of the West End, which has changed from a purely residential district into an important business and entertainment centre. There is an extensive underground railway system.

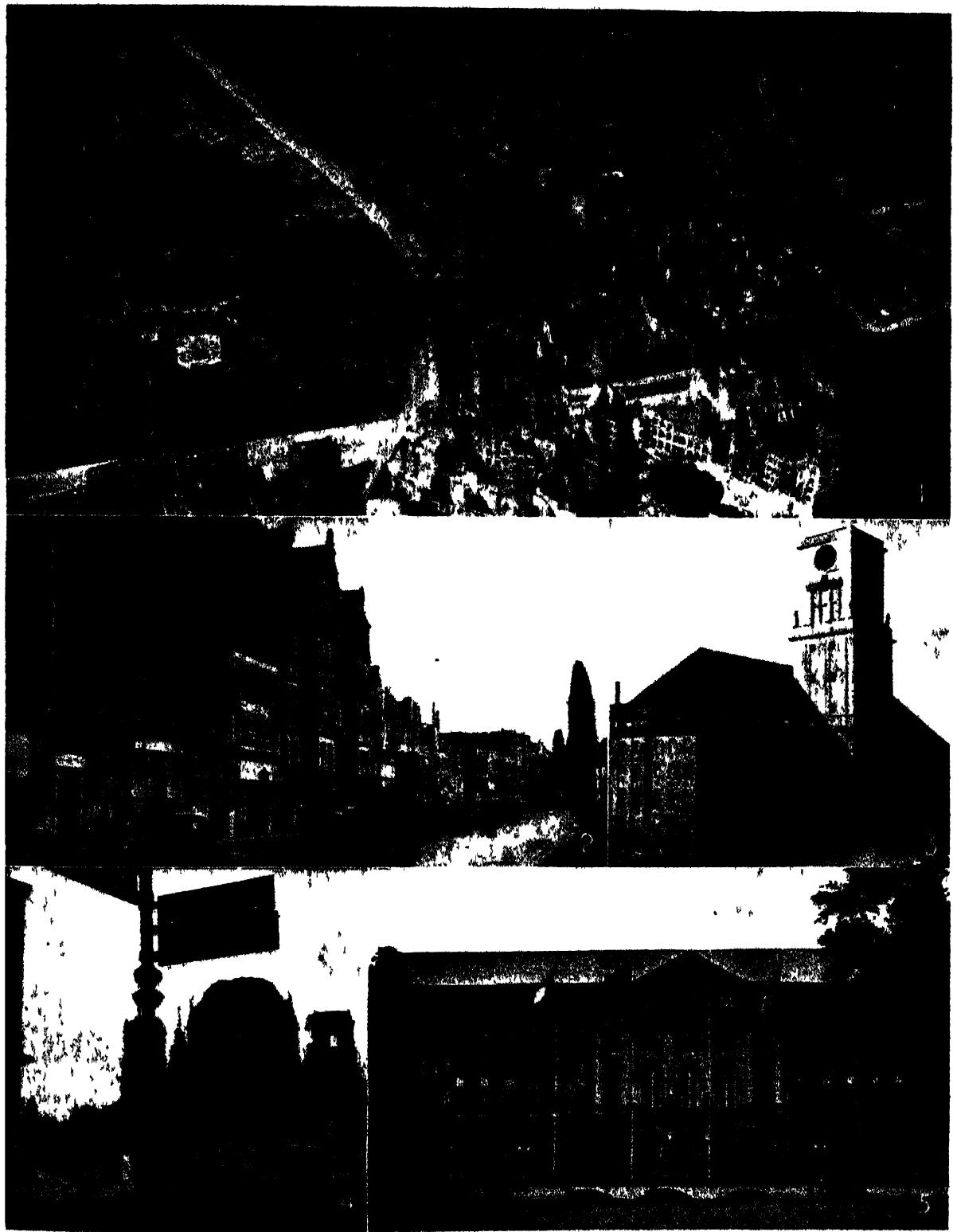
Berlin is a very important industrial town, since it is the hub of the railway system. The manufacture of electrical apparatus and of railway engines are the chief industries. Berlin is the centre of the banking system of Germany. The population was 3,187,500 in 1950.

Bremen. The capital of the state of Bremen

important Gothic building is the Town Hall, which was built between 1405 and 1409.

The chief industry is ship-building. Tobacco also is manufactured. The population in 1950 was 444,550.

Dresden. The capital of Saxony is situated 111 miles south of Berlin. The town is built on both banks of the River Elbe; on one bank is the old town, on the other the new town, and the two are connected by five bridges. It first came into existence as a Slavonic village. It became an important centre in the thirteenth century, when the Margraves of Meissen built



BERLIN

1. Aerial view showing the heavy bomb damage suffered. 2. New shops and flats are springing up in the main centres. 3. The Town Hall in Berlin-Schöneberg, headquarters of the Berlin City Parliament. 4. The Kurfürstendamm—before the war one of Berlin's best known streets. In the background are the ruins of the Royal Cathedral. 5. Headquarters of the Allied Control Commission set up in June, 1945.

Photos. Associated Press; Keystone

their castle there. It is first mentioned as a town in 1216. Under King Augustus III Dresden attracted one of the most gorgeous courts in Europe.

Dresden owes its finest architecture to its princes. The old town has a number of important Baroque buildings. The city is beautifully laid out with squares and parks, the biggest of which is the Grosser Garten, which contains a museum of antiquities and a zoological and botanical garden. Among the fine promenades is the Bruhl Terrace, 400 metres long (built in 1738), which has been developed from part of the city's ancient fortifications.

The oldest industry is the manufacture of cigarettes. The present industries include the manufacture of chocolate, textiles, optical and photographic instruments, and metallurgical goods. The famous Dresden china is manufactured chiefly at Meissen. Dresden is an important railway junction. The population in 1950 was 468,000.

Frankfurt. Situated on the River Main, which has been rendered navigable to large vessels, thirty-five kilometres from the junction with the Rhine, Frankfurt ranks as an important port.

The town was first mentioned in 793. In 1220 it claimed independence. The Golden Bull, issued in 1356, designated Frankfurt as the town where the election of the Emperor should take place and after 1562 all German

Emperors were crowned there. Napoleon made Frankfurt into a Principality, but in 1815 it again became a Free City. In 1866 it was united with Prussia. In the oldest part, on the right bank of the Main, are situated the richest and most picturesque buildings.

Frankfurt is important as a trading and banking centre. The huge I.G. Farben chemical dyeworks are situated here. Badly damaged during the war, they are now in full production once more. The population in 1950 was 532,000.

Hamburg. The most important port in Germany and the second largest city, Hamburg is one of the greatest commercial centres in Europe. Situated on the north branch of the Elbe, the city is intersected by canals and by the River Alster, which forms two basins known as the Binnenalster and the Aussenalster.

Hamburg is an important centre for money-changing transactions. It is also one of the world's most important coffee markets. The main exports include sugar, coffee, woollen and cotton goods, ironware, machinery, tobacco and paper. Imports are mainly of raw materials, such as hides, wool, tobacco, iron, grain and coffee. An important ship-building industry is situated there. The population in 1950 was 1,600,000.

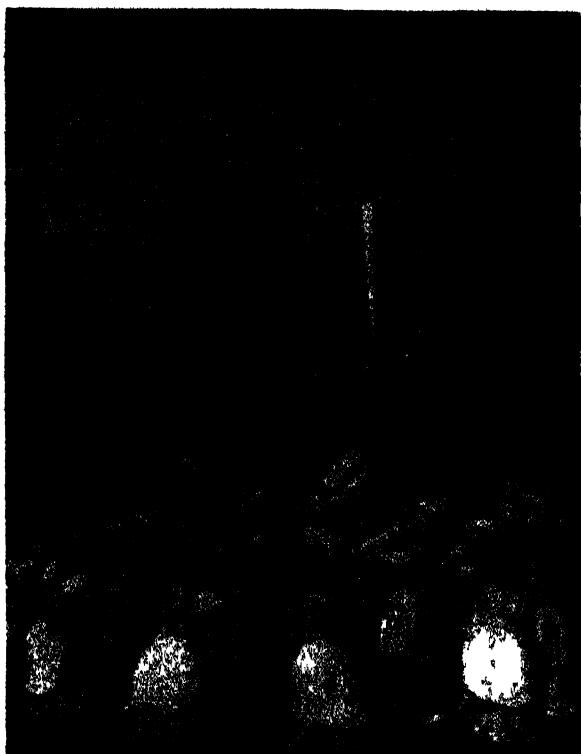
München (Munich). Situated in the midst of the plain between the Alps and the Danube, 1700 feet above sea-level, München lies on the



BONN

The home of the Western Germany Constituent Assembly

Photo: Keystone



THE OCTOBER FAIR IN MÜNCHEN
Traditional dance in the Marienplatz outside the Cathedral
Photo Keystone

River Isar, and is actually built on the former river bed. On account of the proximity of the Alps, which can be reached in less than two hours, there are prevailing west winds, which result in heavy rainfall.

München formerly enjoyed a very considerable political influence as the capital of the second largest state in Germany. It is the seat of an archbishop and the university is second in size to that of Berlin. First mentioned in records in the twelfth century, München became the acknowledged capital of Bavaria in 1253. It has always ranked among the leading towns of Germany and has exercised a predominant cultural influence.

The oldest part of the town is around the old Town Hall and St. Peter's Church, which was built in 1181: the only other building of this period is the Alte Hof. The most important remains of Gothic München are the old Town Hall itself, which was built in 1470, and the Salvator Church (1494). The Frauenkirche (Church of our Lady), built between 1468 and 1488, is the best known landmark.

Of recent buildings the most important are the German Museum, built on an island in the Isar, which was opened in 1925, and the Brown

House in the Brienerstrasse, formerly the headquarters of the National Socialist party. The most famous suburb is Schwabing, since it is not only a very fashionable residential district, but is also the traditional haunt of artists.

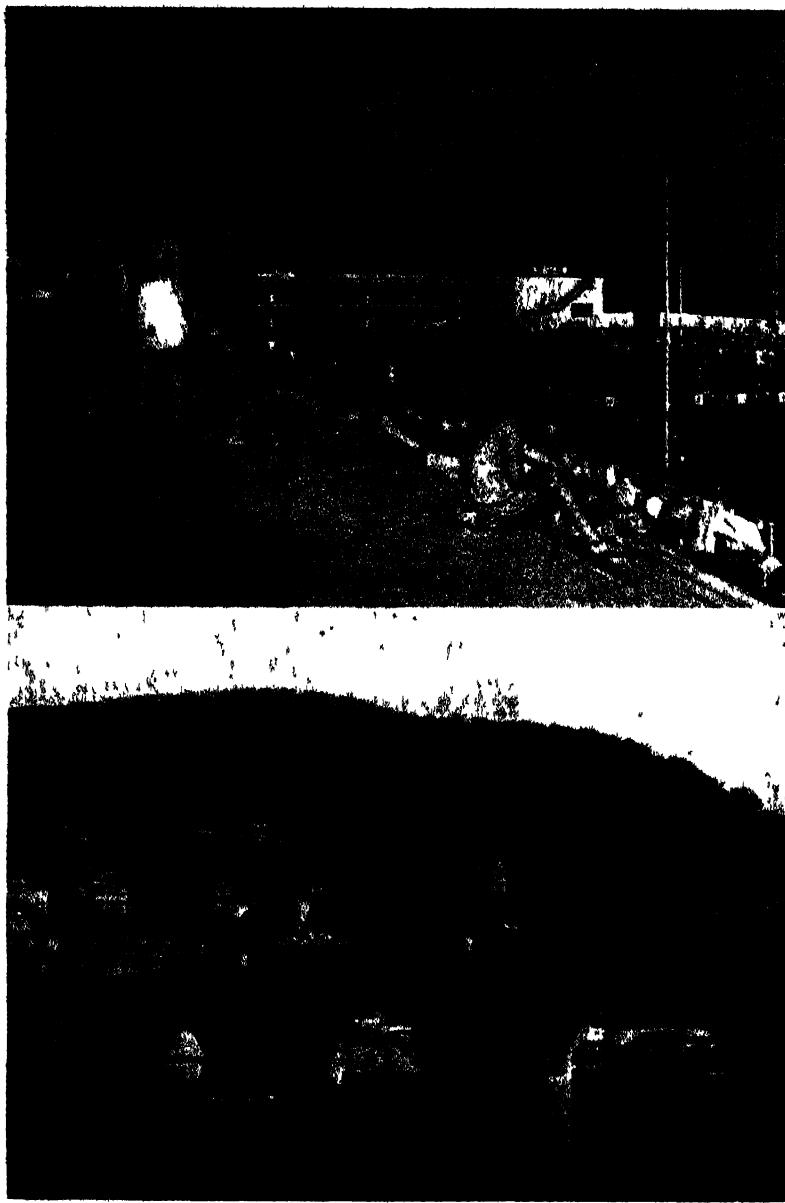
The beer gardens are famous. During the Carnival season and again at the October festival the city is thronged with holiday-makers. In fact München is one of the most important holiday resorts in Germany. It is the most important traffic junction of Bavaria, and the main station is the biggest in Europe. The brewing industry ranks first, and there are very considerable manufactures of high-class furniture and locomotives, engines and motor cars. The population in 1950 was 832,000.

Other Towns. (Population figures for 1950 are given in brackets.) AACHEN, formerly Aix-la-Chapelle, is the traditional burial place of Charlemagne. It is an important centre for wool weaving. (130,000). AUGSBURG, one of the Free Cities of the Middle Ages, and an important commercial centre. (185,180).

BADEN, a famous watering place on the edge of the Black Forest. (30,300.) BAYREUTH, which contains the Wagner Memorial



TREPTOW
The Russian War Memorial
Photo: Associated Press



PROVINCIAL LIFE

Above The crowded swimming pool at Düsseldorf. Below The 16th century bridge at Heidelberg

Photos German State Railways, Fox

Theatre. (37,200.) BONN, the seat of government of the Federal Republic and the birthplace of Beethoven. (115,400.) BRUNSWICK, or Braunschweig, situated in a coal-mining district. (223,760.)

CHEMNITZ, a commercial and industrial city of Saxony. The chief industry is the manufacture of textile fabrics. (250,200.)

DORTMUND, an important mining city in Westphalia. It possesses the oldest Town Hall in Germany. (507,350.) DÜSSELDORF, a

medieval town which now owes its importance to its iron and steel manufacture. (500,500.)

ESSEN, in the former Rheinprovinz, lies in a rich coal and iron district. The Krupp works are situated here. (605,400.)

HALLE, capital of Saxony-Anhalt, outstanding for the production of salt and for the manufacture of machinery and iron and copper goods. The University was founded in the seventeenth century. Handel was born here. (222,500.) HANOVER used to be the capital of its province. It has important metal industries and is a great railway centre. (444,300.) HEIDELBERG, in Baden, has some of the finest medieval buildings in Germany. The University is the oldest in Germany. (116,500.) JENA, in Thuringia, the seat of a famous university and centre for the manufacture of optical instruments. (58,400.)

KARLSRUHE, formerly the capital of Baden, manufactures machinery. (198,840.) KASSEL, former capital of Hessen-Nassau, a famous art and musical centre, manufactures engines, scientific instruments and chemicals. (162,130.) KIEL, the chief town of Schleswig-Holstein, was the headquarters of the German fleet. Its chief industry is ship-building. It has a university dating from the seventeenth century. The Kiel

canal, which is 61 miles long, is the short cut between the Baltic and the North Sea. In 1951 alone it handled 52,625 ships. (254,450.) KREFELD, in the former Rheinprovinz, is a centre for the silk and velvet industry. (171,870.) KÖLN (Cologne), a historic city of North Rhine. It has a noble medieval cathedral. Engines and the famous eau de Cologne are manufactured here. (595,000.)

LEIPZIG, in Saxony, is the seat of the third

largest university in Germany and an important centre of bookselling and publishing. Three annual fairs are held at the New Year, Easter and Michaelmas. (607,700.) LUBECK, formerly a Free City-state, has interesting medieval architecture, and trades in timber, grain, coal, iron and wire. (238,280.)

MAGDEBURG, formerly capital of Saxony, is famous for its medieval churches. It manufactures machinery and is the centre of the

There is also an important leather industry. The philosopher Hegel was born here. (496,680.)

WIESBADEN, a residential watering place in old Hessen-Nassau. (220,740.) WORMS, in Hesse, an ancient city of historic importance. The chief industries are manufacture of leather goods and breweries. (51,500.)

Results of the War. Owing to the intensive bombing to which Germany was



NÜRNBERG

In the foreground can be seen the four cells radiating from a central point which housed the war criminals during the famous trial
Photo Keystone

sugar beet industry. (236,330.) MAINZ, in Hesse, was formerly an important fortress town. It has valuable trading connections with Holland and Belgium. It is a centre for the wine trade. (159,000.) NÜRNBERG (Nuremberg), is famous for children's wooden toys. Its name is associated with the rallies held there under the Nazi regime. The city has preserved its medieval appearance. Dürer spent part of his life here. (362,460).

POTSDAM, near Berlin, is celebrated as the former residence of the Emperors. (113,570.)

STETTIN, ex-capital of Pomerania, was one of the most important ports of Germany. The Potsdam agreement of 1945 gave it to Poland. STUTTGART, the capital of Württemburg, is a centre for printing and book-publishing.

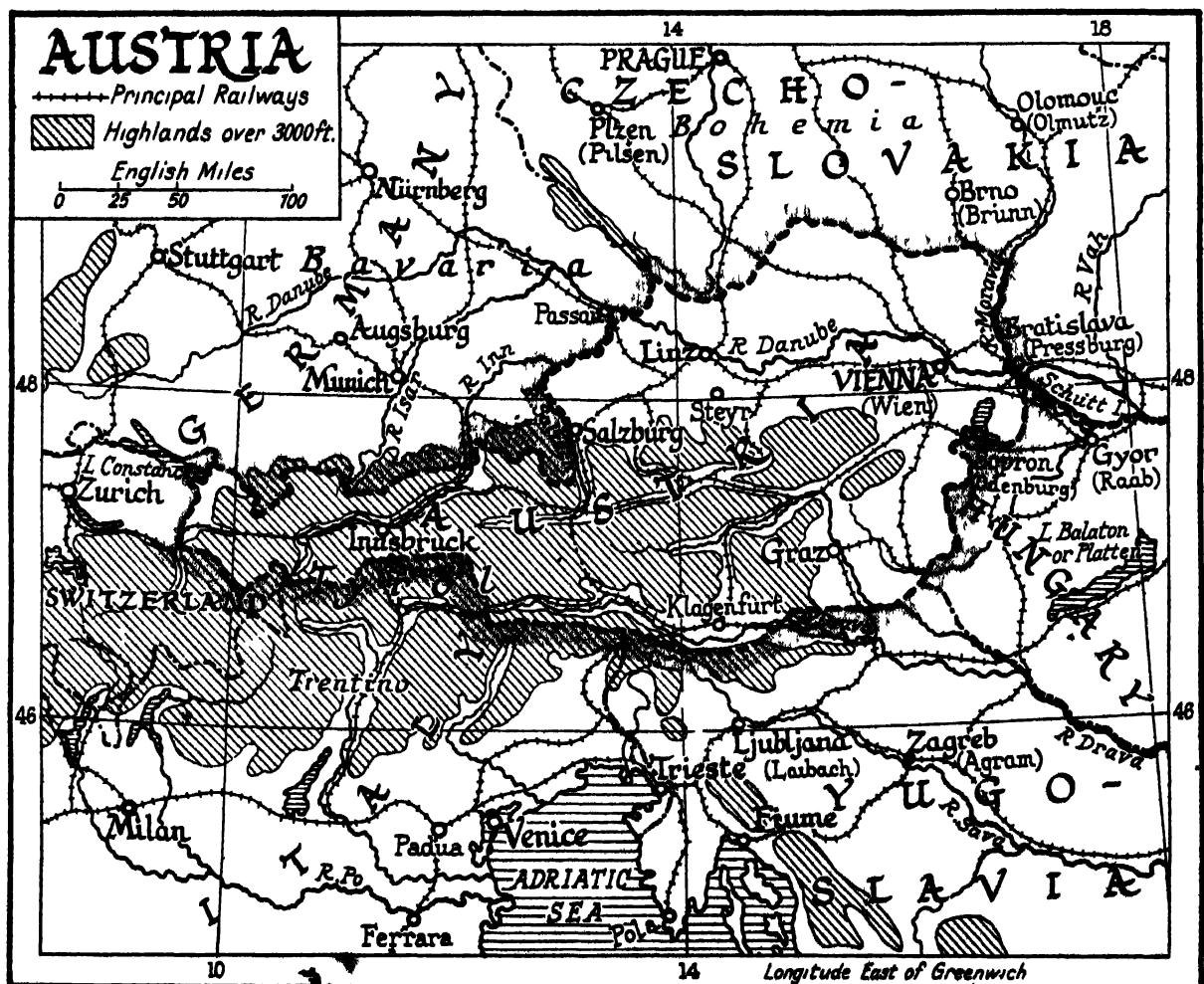
subjected by the Allies, the traveller to-day will find many old landmarks and beautiful buildings destroyed. Berlin probably suffered more than any other European city and the Ruhr towns and North German ports were also very badly damaged. Dortmund, Düsseldorf, Essen, Karlsruhe, Kassel and Geslenkirchen were among those towns that were relentlessly bombed, while Köln was the target of a series of particularly devastating raids. In the north, Hamburg, Bremen, Rostock and Lübeck lost many of their finest treasures.

Although under the peace terms, certain German factories producing war materials were dismantled, causing temporary unemployment, most of these factories are now turned over to peacetime requirements.

AUSTRIA

AUSTRIA, in size a little larger than Bavaria, and with a population almost as big, is now once again an independent republic. It stretches from the Swiss frontier, where it borders the Vorder Rhein (Rhine) and the

450 kilometres in length. In the east, the distance between the frontiers, measured from north to south, is about 250 kilometres. As we approach Switzerland the northern and southern frontiers draw slowly together,



Bodensee (Lake Constance), to where the flat plains of the easternmost province, Burgen, merge with those of Hungary. In the north it is bounded by Germany and by Czechoslovakia; in the south by Yugoslavia and Italy. Austria lies on an east-west axis some

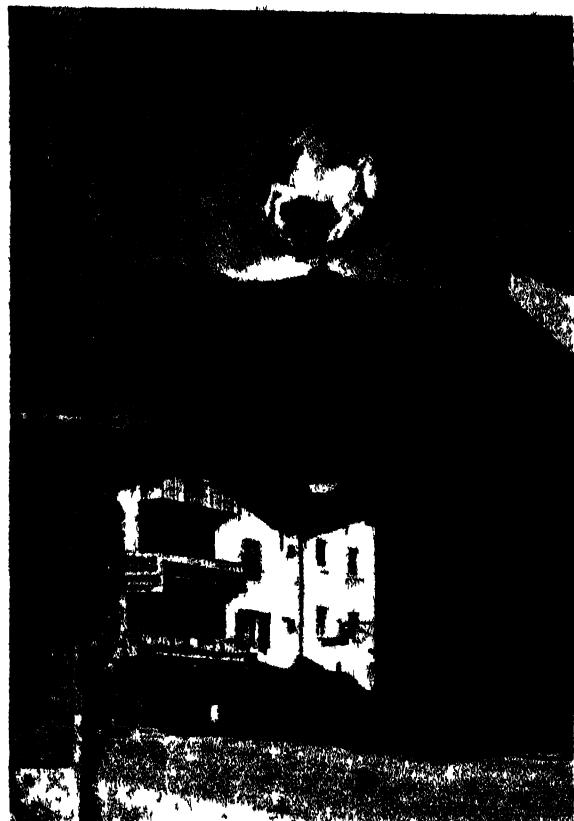
giving the western end a corridor-like appearance.

This mountainous country has many points of resemblance with its smaller Swiss neighbour. Seventy per cent of its area is covered by the Eastern Alps. In the north-east, where the

Danube runs latitudinally through the country, there is a highway of lower-lying land; but almost immediately north of the river rises the granitic Bohemian massif (Bohmerwald). East again, but still north of the Danube, is the Marchland, where the wheatfields stand upon the flat land traversed by the River March. A little above Klosterneuberg the Danube changes its course and flows south-east, passing Wien and reaching Bratislava in Czechoslovakia, just across the frontier. Due south of this part of the Danube extends the border province of Burgen, deeply penetrated by Hungarian influences.

Moving farther south and west we enter Steiermark and the plains give way to the hilly country of the Mur Valley below Graz. Beyond are the Alps, stretching almost unbroken to the Swiss frontier, and enclosing the small Klagenfurt Basin, through which runs the Drau or Drave River. The Bohemian massif accounts for 10 per cent of Austria's area; the Danubian basin in the north for another 8 per cent; the Wiener Becken, the Marchfeld and the Mur Valley in Steiermark for the remaining 12 per cent.

The tiny province of Vorarlberg forming the western tip of Austria is more a Rhenish than an Austrian land and for a time it was incorporated in the Tirol. Its closest economic link is with Switzerland. Its only line of communication with the east is that which leads over the Arlberg Pass. The old-established



THE WHITE HORSE INN AT ST WOLFGANG
Photo German State Railways

embroidery and lace manufactures of the district find their markets in St. Gallen, and many of the Swiss chocolate concerns have extended into this region. The traditional costumes worn by the peasants are also more like those worn by their Swiss neighbours than those seen elsewhere in the Tirol.

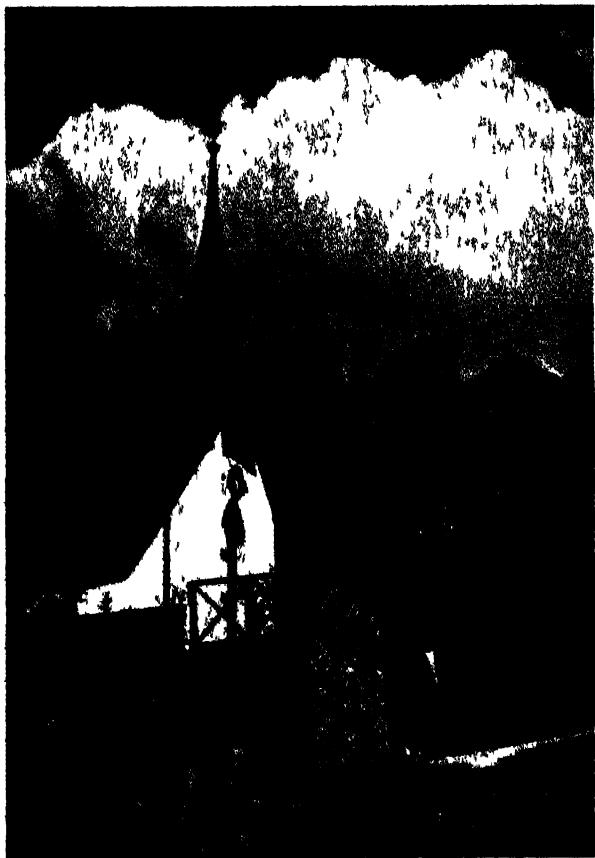
From Switzerland the central European Alps continue eastwards through Austria almost to the gates of Wien, providing the country with, as it were, a backbone of high mountains. Four geological zones can be distinguished in this Alpine structure; a ridge of sandstone in the north, with peaks rising 6000 feet; giving way, farther south, to the finely sculptured and richly wooded Northern Chalk Alps; which in their turn are succeeded by the Eastern Alps, a range of gneiss mountains bordered by soft slates, their peaks rising to 11,500 feet; followed, still more to the south, by the southern chalk zone, the Gailtaler and Karawanken Alps that form Austria's mountain frontier with Italy and Yugoslavia.

Communications. The physical structure of Austria does not allow good communications.



SCHLOSS SCHÖNBUND
One of the castles of the Tirol
Photo: German State Railways

The railways are nearly all important through routes. The east and west lines run through the northern valleys, the north to south valleys connect the Hungarian and Italian systems with these and all are focused at the great junction of Wien. There are about 4000 miles of railway and most of them are state-owned. Motor traffic is not heavy but inter-



THE CHURCH AT KAISERGEBIRGE

Many similar rural churches are to be found in the mountains

Photo German State Railways

national air traffic which was growing in 1939 is again likely to be important. The Danube is a most important trade-link with other eastern European countries; there are no other important water routes.

The Tirol. The long corridor of Tirol lies entirely within the Alpine zone. Such unity as it possesses is derived from the River Inn, which flows through it from south-west to north-east, entering Bavaria at the town of Kufstein. The Inn Valley is, for Austria, densely populated. Small towns and villages follow each other at such close intervals that the church tower and spire of one can almost

always be seen from its neighbour. Along the south bank of the Inn the mountains are broken by innumerable valleys, through which tributary rivers flow northward to empty their waters into the main stream. The most important of these *quertaler* or transverse valleys is the Wipptal, leading south from Innsbruck to the Italian frontier and the Brenner pass, the watershed between the Inn and the Adige Rivers. Over this historic route the Holy Roman Emperors passed on their way from Italy into Germany, and to it the town of Innsbruck owes its origin. Since the construction of the railway in 1864 the route has regained and increased its economic importance, while the delimitation of the southern Austrian frontier in 1918 and 1945 has given the whole region a high strategical significance.

Along the Inn Valley itself, terraced mountainside agriculture alternates with industrial activities. Salt and iron mines were worked here even in Roman times, while to-day there is in addition a small textile industry, *loden* being produced at Telfs and cotton at Landeck and Imst. South of the Inn Valley, in the region of the transverse valleys of which we have already spoken, lie the Stubai, Tuxer, and Kitzbuhler Alps, and to the south-east the Hohe Tauern.

The mountains of Austria, and particularly those of the Tirol, are remarkable for the great beauty of their scenery and for the excellent facilities they offer for winter sports. In consequence the Tirol now attracts considerable tourist traffic.

Steiermark and Kärnten. To the south of the Hohe and Niedere Tauern we find the long narrow Valley of the Drau, running through the province of Kärnten. Beyond the Worthersee the valley opens out into the Klagenfurt Basin, an expanse of low hilly country framed on all sides by the mountains, the Gurktaler and Sau Alps in the north and the Karawanken in the south. Crossing the Sau and Kor Alps we are already in Steiermark, approaching Graz and the Valley of the Mur.

The Mur and Mürz Rivers form the shape of a "T." The direction of the cross-bar is from south-west to north-east and the bar itself is composed of the Mur, which flows in this direction from Knittelfeld to Bruck, and the Mürz, which, coming from Stuhleck, flows into the larger river at Bruck. At this point, where the two rivers meet, the Mur makes a right-angle bend, and continues in a generally

south-east direction to Graz and on to the Yugoslav frontier.

Steiermark and Kärnten are the most densely wooded of the Austrian provinces, forests covering 45 per cent of the latter and nearly 50 per cent of the former. The Mur-Mürz region is rich in iron ore, and the combination of iron ore and wood fuel was early responsible for the growth of the Styrian iron industry. The

To the north is the Danube, and beyond it, the Marchfeld.

Westwards up the Danube we come to the capital, Wien. Stretching almost due south, to Wiener Neustadt and to Neunkirchen, is the Steinfeld, Austria's second most important industrial region. North and again west is the Wiener Wald, wooded and hilly, a holiday refuge for the millions who inhabit the country's



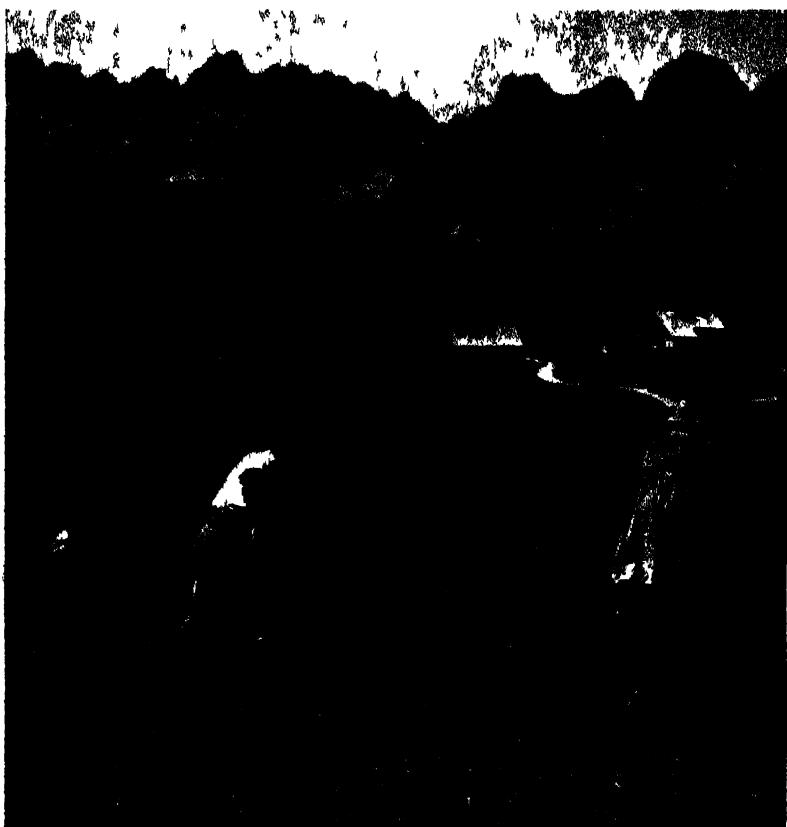
THE TIROL
Pastoral valley near Obermeimung
Photo German State Railways, O V W

forges, in those far-off times, were scattered throughout the forests. Concentration only began after the replacement, about 1850 to 1870, of wood by coke. A considerable amount of fuel, mainly lignite, is mined along the Mur Valley, though not enough to fulfil the incessant demands of the highly-developed iron and steel industry. Large quantities of coke are now brought by rail from Silesia via Wien and the Semmering Pass. The whole of this industrial complex, the most important in the country, is owned by the Ostalpin Montan-gesellschaft, a giant concern having close affiliation with the Ruhrgebiet.

East of the Mur Valley we enter the plains of the province of Burgenland, at one time part of Kärnten, lying in a narrow north-and-south strip between the Czech and Hungarian frontiers and the eastern confines of the Alps.

greatest city. Voslau, Baden, and Modling, Kaltenleutgeben and Liesing are the most important of the wine centres of the district. West of Wien, and bordering the south bank of the Danube, is the Tullner Feld, a low-lying stretch of fertile agricultural land whose produce helps to feed the population of Wien.

North of the Danube. Before proceeding farther westwards up the Danube in the direction of Linz, a word must be said about the country north of the river. In this northern part of the province of Nieder Österreich we find a sharp climatic distinction between the Weinviertel (where the wines of Retz and Haugsdorf are justly famous) on the sheltered eastern side of the Manhartsberg, and the Waldviertel to the west of the same range. The peasants of the Waldviertel take a somewhat gloomy pride in the weather conditions



THE HAY HARVEST IN A MOUNTAIN VALLEY
Photo German State Railways, O V W

with which they are afflicted, describing it as "three months winter and nine months cold." It is an impoverished and neglected part of Austria where the pre-industrial domestic system still prevails among the carvers of wooden toys and the hand-loom weavers.

From where the white walls of the baroque Abbey of Melk overhang the river to the ruins of the Castle of Dürnstein, in which Richard Coeur-de-Lion was once held captive, the Danube flows between the granite walls of the deep gorge which it has cut for itself through the southward-extending highland; and the whole district, known as the Wachau, its scenery reminiscent of the Rhineland, is one of incomparable grandeur and beauty.

Above Melk to Linz and to Passau, where the Inn flows into the Danube, the river runs through the Alpenvorland, a wide corridor separating the Bohemian massif from the true Alps.

Tributary rivers flow northward from the Alps to the Danube, bearing in season their cargo of logs cut from the Alpine forests. Among the more important of them are the Traun, an industrialized valley containing

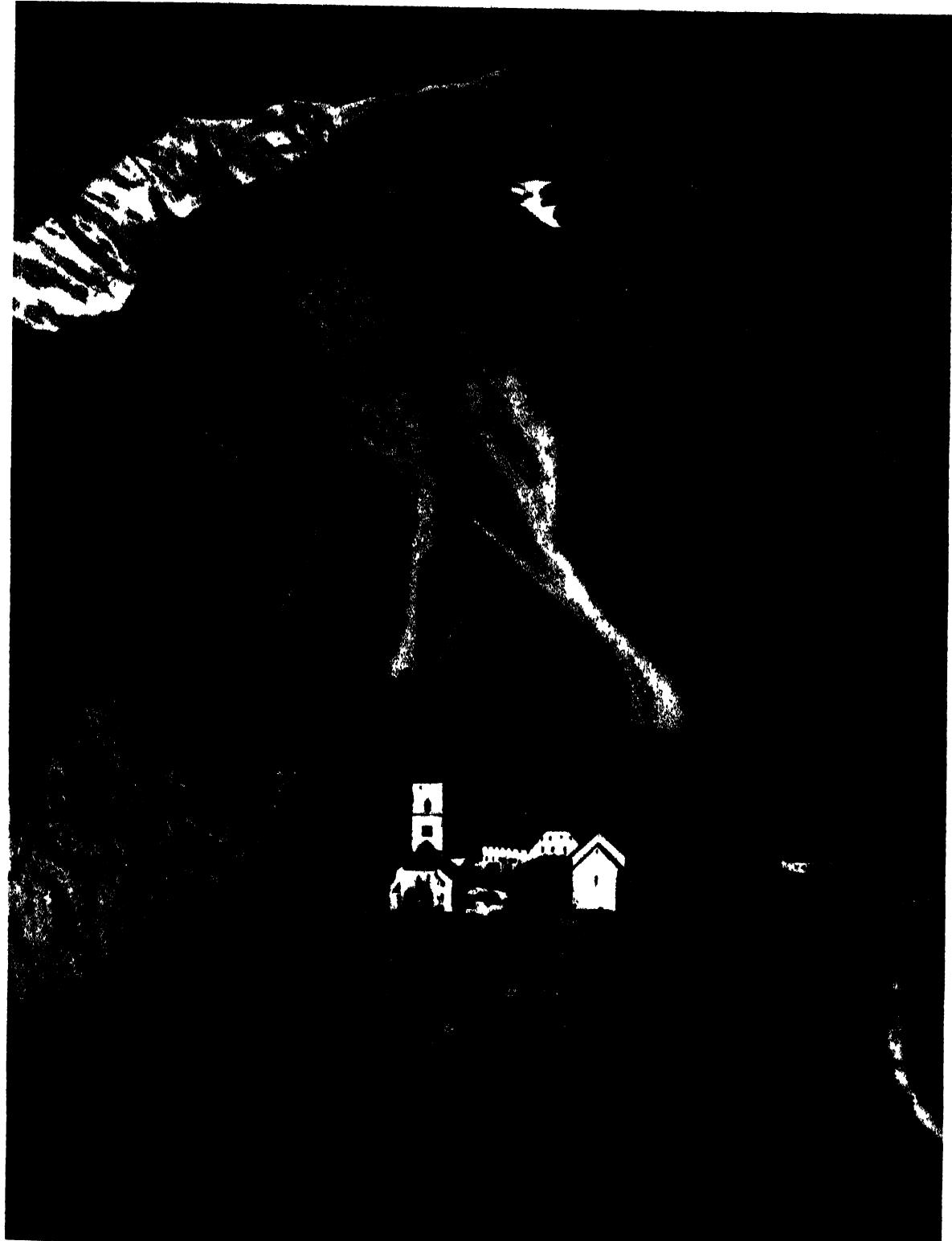
important textile and paper works; the Enns, upon which stands Steyr, centre of Austria's motor-car manufacture and noted for its armament works; and the Ybbs and the Traisen, upon both of which are great power stations, supplying electric current to the industrial concerns grouped about them. Linz itself, situated a little above the confluence of the Traun and the Danube, handles a considerable transit trade which, together with its many light industries, has made it the third largest of the towns of Austria.

West of Linz and the Traun River is the Hausruck, an industrialized region noted for its lignite mines; beyond, as we come to the Innviertel, the country slopes down to the north, and the large farms stretch away to the borders of Nieder Bayern. The Innviertel is contained within the angle made by the Inn and the Danube Rivers; the former, from Passau to Braunau, marking the boundary between

Bavaria. The Inn reaches Braunau, its confluence with the Salzach, by making a wide sweep through Bavaria; and if we mount the river we re-enter Austria at Kufstein. From Braunau the boundary is marked, for some distance, by the Salzach, which flows north and a little west from the Pongau, cutting through the Salzburger Alps and reaching the boundary a little below Salzburg. Before reaching the Pongau, the Salzach has come through the latitudinally-directed valley known as the Pinzgau, one of the wildest and most beautiful stretches of Austria's Alpine scenery.

The Austrian Lakes. To the east of Salzburg is the Salzkammergut lake district. The Mondsee, Attersee, Hallstattersee, Traunsee, Aussee, and Grundlsee, their still blue waters reflecting the sky and contrasting with the light greens of the valley grass and the darker greens of the mountain forests, are scattered among the high peaks; and the tidy villages, with their fine baroque churches, are the homes of an industrious peasantry.

Following the Salzach to its source, we are



STEIERMARK NEAR PURGG

Photo: German State Railways

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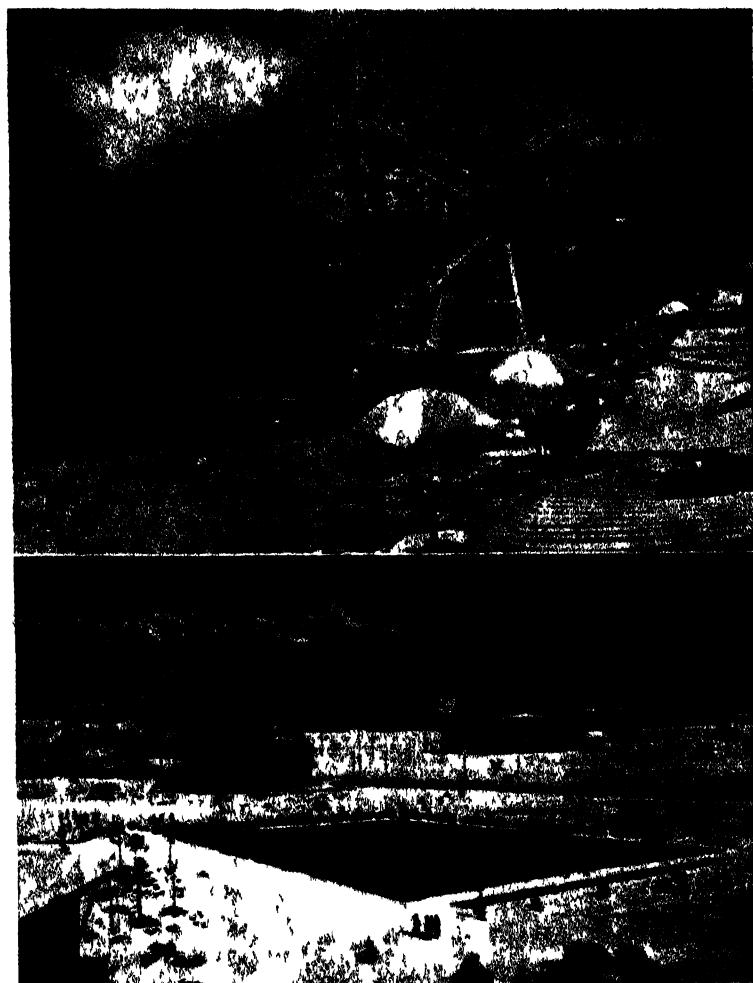
already approaching the Tirol and Innsbruck, and our circular journey around Austria is completed.

The People. Nothing is more typical of the Austrian landscape than the high mountains and forests. Nothing has exercised a greater influence in moulding the habits and in shaping the whole mode of living of the Austrian people. They break up the population into small groups, separating one district from the next and isolating the villages. Regional differences are very strongly marked, as can be easily seen by anyone who cares to watch the peasants or farmers at their work, or, even more, on Sundays when they go to church dressed in their finest costumes.

The rural people of Tirol, Salzburg, and the eastern part of Kärnten still cling tenaciously to old traditional ways; in Steiermark and Nieder-Österreich, the bonds of custom have been loosened, in part the result of growing industrialization, in part due to the influence exerted by Wien.

MOUNTAINS cover nearly three-quarters of Austria. The strong local patriotism of the mountain peasants is in striking contrast with the universalism of Wien. A mountain peasant usually will state that he is a Tiroler, or, perhaps, a Zillertaler or Stubaitaler for the mountains are his horizon; and he cannot see, or does not wish to see, beyond them. He knows every tree and stone in his own valley and every mountain footpath; on the far side of his mountain live foreigners, with whom he never comes into contact.

The mountain peasants of Austria are old-fashioned, slow-thinking, and suspicious of new ideas. This habit of mind is to some extent dictated to them by the difficult nature of the country in which they seek their livelihood. The peasant of the lowland is better able to keep pace with advancing technique. He may use tractors, introduce machinery, sell his milk to the milk combine, but the mountains are usually isolated from markets, either for



Above The bathing station at Millstatt, Carinthia. Below A winter holiday centre near Innsbruck

Photos German State Railways, O V W

selling or buying. The mountain peasant must be self-sufficient to a much greater degree, growing the food which he eats, procuring the hide for his shoes and leather trousers, cutting his own timber and making the bricks from which his house is built. But for tobacco, he seldom buys from a shop.

The life of the peasants living in the Tirol and in Salzburg, eastern Kärnten and western Steiermark, and in the higher regions of Ober- and Nieder-Österreich, is centred around a single theme—that of struggle with the mountains.

The houses of the peasants show this clearly, especially if compared with the farmhouses of the lowlands. In the plains the farms are large and spacious, open on all sides, the different farm-buildings—houses, stables, threshing-floor



ARLBERG
Ski prints in the snow
Photo German State Railways, O V N

and the like—being grouped around a wide courtyard. The peasants' houses in the mountains are small, built of rough grey stone and timber, the pointed roof weighed down with heavy stones. They lie close to the forest, pressed against the mountain-side; there is no courtyard, and the stables and other farm buildings are some distance away, so that, if an avalanche should bring disaster, one or the other, the peasant's livelihood or his home, should escape destruction. The houses always look new, their walls, adorned with highly-coloured paintings, and broken by the intricately carved shutters of the windows, are encircled by outside balconies.

The differences we have noticed extend not only to the houses but to the villages themselves. In the lower-lying country the houses either straggle along the main road (as in the *strassen-dorfer*) or else group themselves around the church. The former arrangement is commonest in Karnten and Nieder-Oesterreich; but, throughout the lowlands, the fields lie in a wide circle, surrounding the village and

already touching the fields of neighbouring villages.

Mountain Villages. The mountain villages have no particular centre. The houses are scattered, often separated from each other by woods and fields, and never on the same level. If the houses happen to be numbered, we may find number four shortly after entering the village, but number six may be two hours' walk farther up the mountain-side.

Thus the peasant of the mountains lives in the narrow circle of his house and fields. In them his whole life is centred; the farm, which he has inherited from his father, and which has been inhabited, often for centuries, by his forefathers before him, matters more than family or even self. The eldest son inherits the farm, and either employs his younger brothers and sisters on the farm itself, or pays them out a share of the inheritance so that they may find employment elsewhere, save, and in time marry and start life with a small farm of their own. With the farm, the eldest son acquires the name held by his father. The name descends with the farm and not with the person. Whoever reigns over and possesses the "*Stanzerhof*" is the "*Stanzerhofbauer*," whatever his surname may be. The peasant's Christian name and his farm name are commonly used: no one ever troubles to remember his surname, which is needed only at his christening and his marriage, and for the official registration of his death.

Differences in Types and Dialects. Differences in racial types, and differences in dialect and dress, are very noticeable in Austria. In the Tirol, for example, one can find many who bear a strong resemblance to

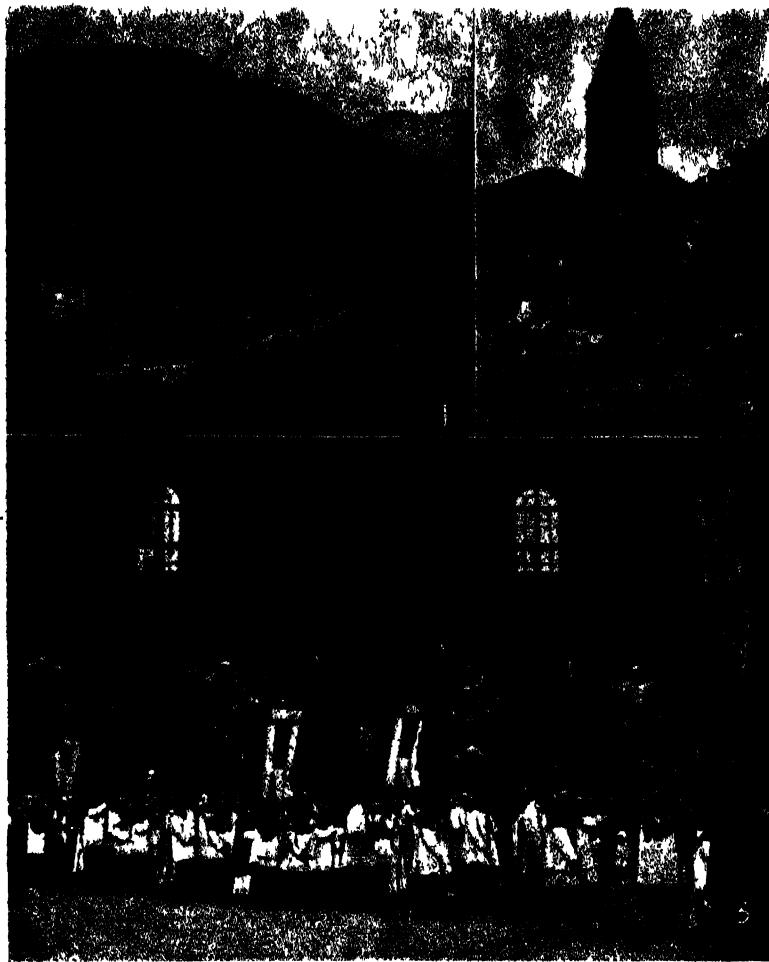


A WINDMILL AND FARMHOUSE IN THE FLAT COUNTRY OF KÄRNTEN
Photo German State Railways, O V B

the Italians across the frontier, and to the Swiss of St. Gallen. Kärnten shows the strong influence of Yugoslavia, and a not inconsiderable proportion of the population are Croatian-speaking. In Salzburg and Ober-Österreich the racial type is more emphatically Teutonic, and a close bond exists between the people of these two provinces and of Bavaria. In Nieder-Österreich we still find the true Austrian type—long-headed, strong-featured, with blue eyes and brown hair—though as we approach the eastern frontier Hungarian influences, in race and dialect, in dress and mode of life, become more and more apparent.

Costumes. In the mountain regions of Austria the peasant still wears his traditional, and practical, costume. The heavy boots are dictated by the nature of the country, as are the leather shorts. Many of the garments, and especially the women's dresses, are home-spun. The men's shirts and women's frocks are generally made of coarse linen, and are hand-embroidered. Coats and jackets are of strong felt or Austrian *loden*.

The peasants are hard-working, quiet, and sedate people. Their cheerfulness, and even hilarity, is reflected in their music and their dances, and in the fine costumes, cut often from highly-coloured materials, worn in state on Sundays. After the church service is over and a large meal has been eaten at home, the peasants gather again for the evening at the village inn. The men wear grey or green trousers, bright waistcoats, jackets with silver buttons (or, sometimes, to demonstrate its possessor's wealth, silver coins) and high-crowned green hats, adorned with feathers or with chamois hair. The women are also eager to look their best, and succeed in doing so, with their tight bodices, full skirts covered with silken aprons, their scarves and ribbons and picturesque bonnets. The natural taste of the Austrian peasant, his simple pleasure in bright colours, and his peasant-pride



RELIGION AND CUSTOMS

1. Ceremony on the Hallstattersee 2. A village church. 3. Procession in Wien
Photos: German State Railways

in possessing something solid which makes him choose strong and enduring materials, are factors which have contributed to produce these traditional dresses of Austria's Alpenland.

Music. The Austrian people are, and have always been, musical. This is true not only of Wien and Salzburg, but of all the small villages where the simple folk-songs and old Teutonic group-dances still play a great part in the life of the community. Interminable songs, sung to a simple melody, are chanted in the evenings at the inn, when everyone sitting round the table has to contribute his own rhymed four-line verse at a moment's notice. After the singing comes dancing, and the *schuhplatterl* and *landler* are stamped out by the entire gathering, the men leading, whirling their partners round and lifting them up into the air. The dance usually ends with a prodigious

blast from the brass band, the men throwing up their hats and yodelling at the very tops of their voices.

The Life of the Peasant. But every Sunday and every festival comes to an end, and, however late it all may have finished, the peasant is up and about his work at the same early hour the next morning. There is much to be done, and even the smallest children lend a hand. At about six years of age the boys begin their working life, tending the sheep and cattle

help of all the saints to safeguard his fields, to protect his flocks and ensure him a good harvest. His religion, with its festivals that mark the cycle of the year, is his ally in the hard struggle he wages against nature and the unfriendly mountains.

The peasant's year begins in the spring with the ploughing and the sowing. The cattle are then sent up to the *almen*—the communal pastures in the high mountains—where they are left to fatten during the spring and summer, watched over by herdsmen who are paid by the village. In the late summer preparations for the harvest begin, and the harvesting is well under way in August. The year comes to a close with the *almabtrieb*—the return of the cattle from the pastures. The harvest is already in, and the grain is being threshed and stored. The *almabtrieb* is therefore a fitting occasion for the great festival of the year. The sleek fat cows are led down into the village, their horns adorned with wreaths of flowers and with ribbons. The delighted peasants pick their beasts out of the flock and proudly drive them to the stable. After the feasting, the village band strikes up, and the dancing and singing begins, lasting into the early hours.

This festival is the last bright light in the peasant's year. After it he has to prepare himself for the long and dark winter months, when communications with other valleys will cease. He and his family will in all probability be snowed-in, and his home will lie under the ever-present threat of the avalanche. Inside the sturdy house, the family gather in the room where the stove burns continuously throughout the winter. There is still much to do on these dark days, as all the farm equipment must be prepared for the coming spring. One year passes into the next, and the peasant, living close to the soil, for ever united with the mountains, for ever struggling against them, continues his life in the traditional ways of his forefathers.

and, later, helping with the harvesting. At ten a boy will be leading the oxen cart. When he is fourteen he is permitted to handle the plough and the scythe. He is now considered to be a man, and takes his place at the family table next to his father. Children thus early employed find little time for schooling, and the school-houses themselves are often at a considerable distance. Every effort is made to overcome these obstacles, and in the winter, when the claims of farm work are less pressing, the children of the mountain valleys may often be seen skiing to and from their lessons.

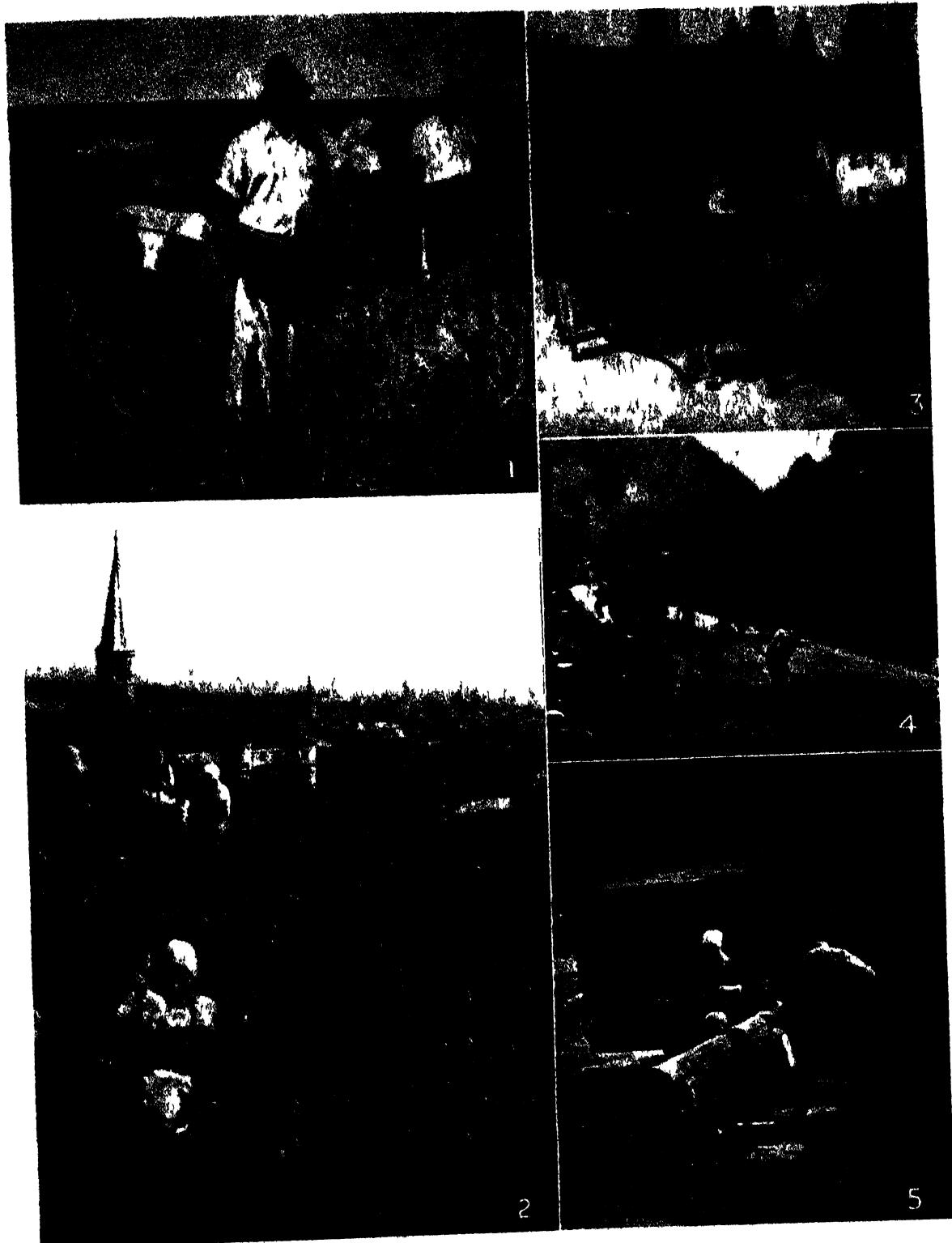
Nine-tenths of Austria's population embrace the Catholic religion; and the numerous churches of the countryside bear witness to their religious devotion. Along the roads, in all parts of Austria, we will find wayside shrines with their crucifixes and pictures of saints, inviting the passer-by to remain for a few moments and offer a prayer for the dead, an invitation to which the peasant invariably responds. The religion of the Austrian peasant, although in some parts of the country showing noticeable pagan survivals, is much more than skin-deep. He invokes the



NATIONAL COSTUMES IN A BEER GARDEN
AT SALZBURG

Photo German State Railways

The Towns. The Danube, the main water way from west to east, intersects on the Austrian plain the few highroads from south to north which scale the Alps by the Brenner, Pyrrn and Semmering Passes. The towns owe their foundation to the military importance of their sites, their growth and wealth to the development and direction of the commercial traffic, their splendour and architectural beauty to the power and understanding of their princely rulers. Wherever the Alpine highways reached the bank of a navigable river the ford or bridge



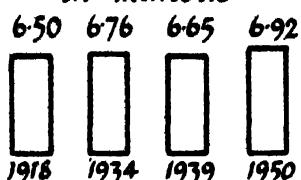
RURAL LIFE

1 Cutting the corn by hand. 2 In the vineyards 3 The ox cart 4 Making a mountain road. 5 Cutting wood for winter firing
Photos, German State Railways, Charles Mougin

AUSTRIA

POPULATION

in millions



Occupational Distribution

in percentages of total numbers gainfully employed



PRODUCTION

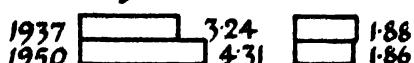
Lignite

Iron Ore

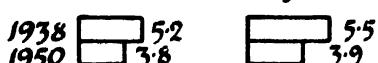
Wheat

Rye

Oats



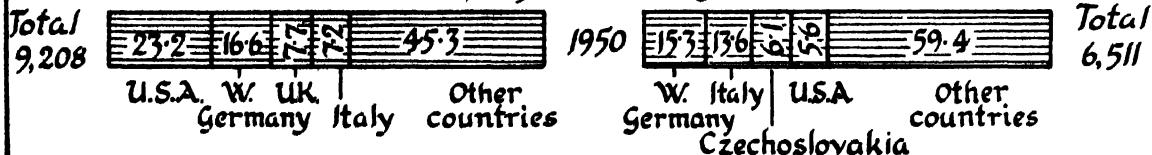
in millions of Metric Tons



in millions of Quintals

IMPORTS & EXPORTS

By countries in percentages of totals of millions of Schillings



was protected by a Roman castle, the nucleus of a rapidly growing town. The names of Innsbruck (Bruck—bridge) and Klagenfurt (Furt—ford) point at this origin.

Innsbruck and Salzburg, as the terminal points of the main road starting from Verona and leading over the Brenner Pass, Klagenfurt and Linz astride of the Pyrrn Pass, and Graz and Wien (Vienna) at the southern and northern approaches to the Semmering Pass are the only noteworthy towns of Austria. All became more or less important centres of commercial life; providing the farmers and miners and woodcutters in the country-side with commodities, receiving the products of the rural parts in their store-houses and developing rather petty manufactories. All these towns became the capitals of the small duchies into which, during the Middle Ages, the March and was divided, and thereby, the headquarters of the administration of the country round about. They have preserved the characteristics of their origin and further development. A moated castle, sometimes erected on a hill overlooking the town, forms the centre of the

place; remains of the fortifications are to be seen which formerly defended the inner quarters. Wide squares are able to receive the crowds of buyers and sellers who assemble even now once or twice a week when the farmers bring their products to market as they have for centuries.

The beautiful scenery around made them centres of tourist travel and thus, at least during the holiday-season, provided a new source of income and the ghost of a metropolitan life. Otherwise their inhabitants carry on the quiet existence of provincials.

Only two of these towns achieved a greater importance: Salzburg and Wien.

Salzburg. The name of Salzburg (Salt town) points to the produce of the eastern Alps which first singled out the borough on the shore of the River Salzach. The salt-mines still represent an important part of Austria's wealth.

In former centuries they were the foremost source of income in many valleys of the highlands. The rivers taking their course from the *Salzkammergut* (the crown estate of the salt-mines) provided the easiest and cheapest

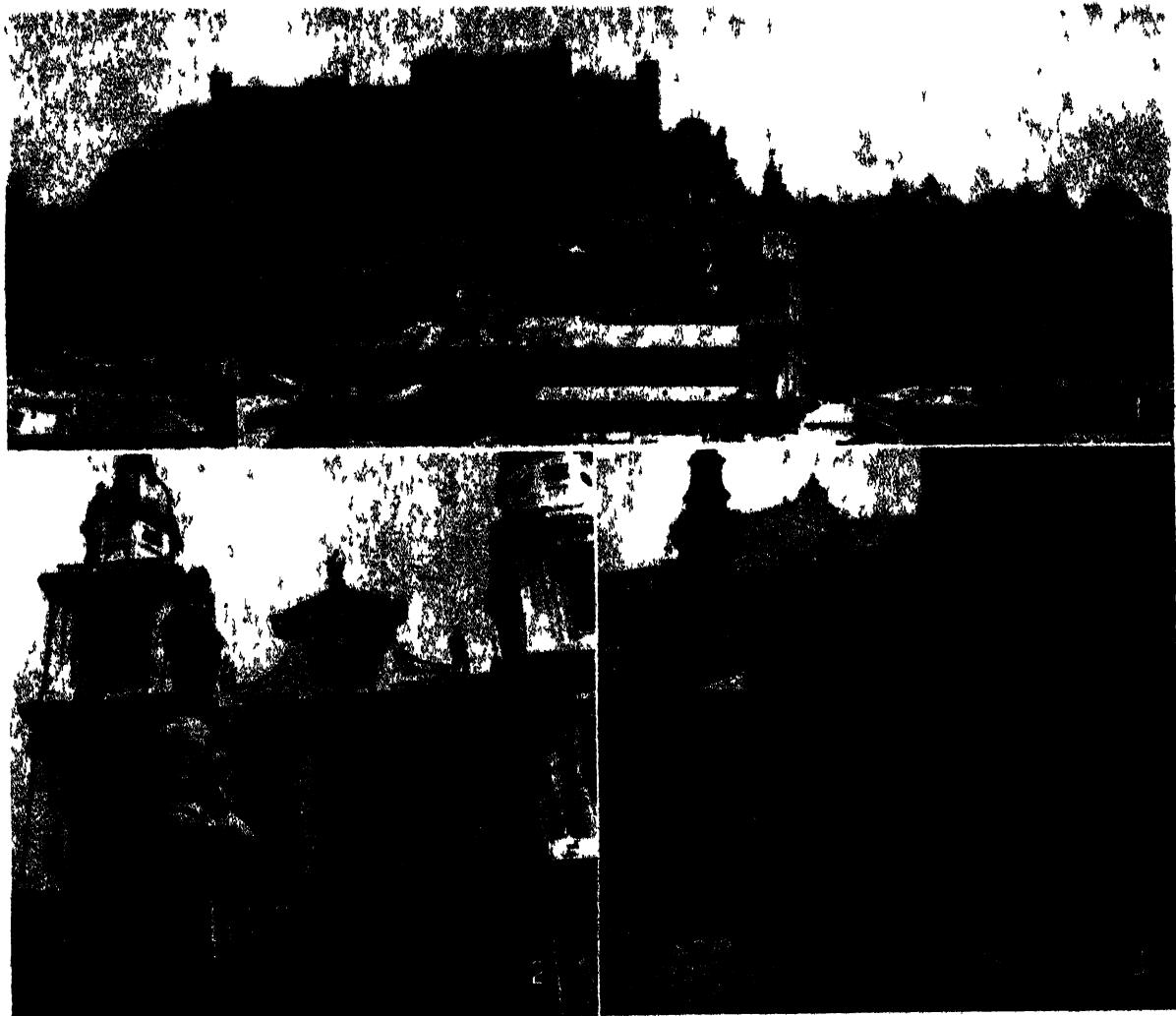
means of transport, and the salt-ships were a well-known feature of the Danube and its tributaries. Salzburg was one of their starting-points.

The Roman salt town was built in the close neighbourhood of the Celtic borough which derived its name from the same mineral deposit: Hallein. *Halen* is the Welsh word for "salt," and the fact that all the places in Austria where salt is dug have names like Hall, Hallein, Hallstatt, gives rise to the hypothesis that a tribe related to the Welsh inhabited the valleys before the Romans from the south and the Teutons from the north invaded them.

The wealth gained by the exploitation of the salt-mines added to the splendour and power of the ecclesiastic rulers who became the masters of Salzburg during the Middle Ages.

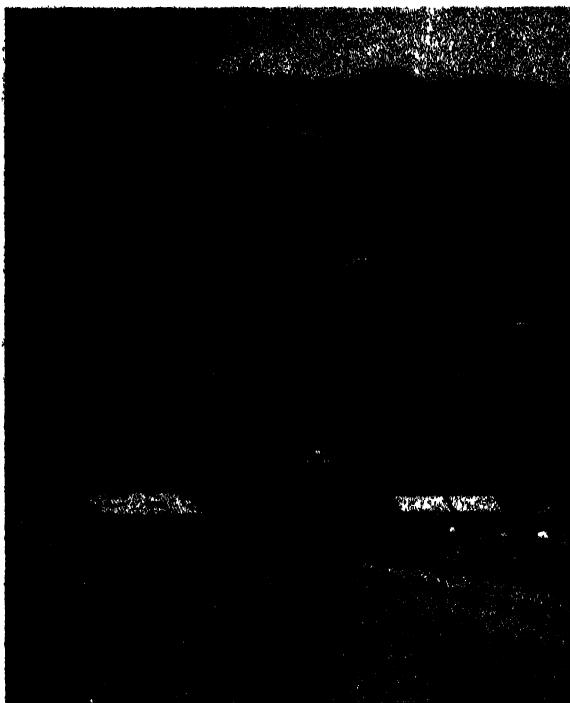
They soon were made Princes of Germany and this proud position, in return, served to enhance the importance of their residence. Rome carefully tried to keep this momentous diocese in close connection with the Holy See, and Italian clergymen were sent over and over again as links between the Papal court and the German province. They were accompanied by Italian clerks and valets, they employed Italian artisans, musicians and architects, and soon the influence of Italian culture and the arts became preponderant.

The aspect of Salzburg reminds one of Italian rather than of German towns, and the high standard of the arts and crafts points to the same direction. The greatest son of Salzburg, Mozart, in his music, gives another proof



SALZBURG

1 The Hohensalzburg Castle and the bomb-damaged Cathedral 2 Mozart's monument in the Domplatz 3 A quiet street scene
Photos Keystone, Picture Post Library



INNSBRUCK
The main street, Maria Theresienstrasse
Photo: Charles Mogné

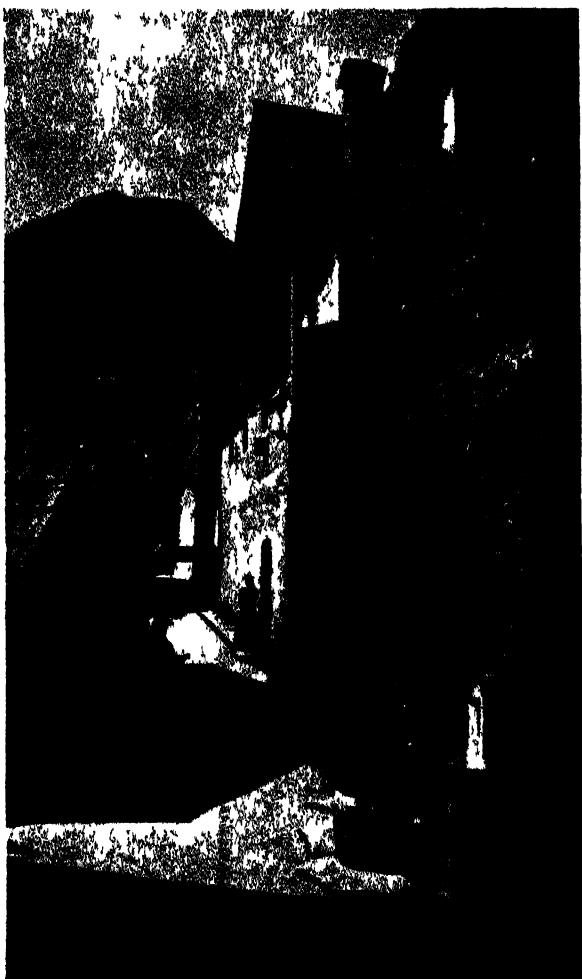
of the influence which the Italian arts exerted upon the natives of the town. This artistic tradition created the right atmosphere for the Salzburg Festivals which, for many years, have assembled international audiences.

Wien (Vienna). The Celtic hamlet Vienna became one of the numerous Roman castra, a border garrison. Situated on the slopes of the spurs of the Alps, guarding the entrance of the Danube into the wide plains of Hungary and commanding the approach to the Semmering Pass, Wien (Vienna) was for many centuries the bulwark of central Europe against eastern invaders. From the days of the Roman Emperor Marcus Aurelius up to Napoleon its neighbourhood has been one of the great battlefields of Europe while the city itself, throughout the political changes, remained the store-house and most important trading-centre of eastern Europe.

Very early, colonies of Greeks, Armenians, Italians and Jews settled down, at first shunned or just tolerated, but in time becoming regarded as countrymen and to some extent intermarrying with the natives. When Wien became the residence of the Hapsburgs, German Emperors and Kings of Spain as well, Italian and Spanish courtiers and soldiers added to the international

character of the capital which, following the union of Austria with Bohemia and Hungary, and, after Poland had been divided between Austria, Prussia and Russia, became the meeting place of the Slav and Hungarian nobility.

The strange mixture of so many nations seems to have brought about a population of refined taste and a certain propensity to artistic creation. Industrialism has altered the conditions as elsewhere, but in Vienna the scene is still dominated by the arts and crafts. In by-gone days its handicraft workers were famous throughout Europe. Thousands of skilled workmen earned their living by carving amber and meerschaum, by working in mother-of-pearl. The Viennese turners, the manufacturers of silk and laces, of leather and glass-ware, stood foremost among their European competitors. The great achievements of the



HALLSTATT
Photo: German State Railways

Viennese handworker in ladies' dresses, musical instruments and furniture of all kinds, still keep their high rank.

The maintenance of the old tradition is very largely due to the Vienna School of Arts and Crafts which originated with success attempts to combine the manual skill of the handicraft worker with the personal originality of the artist. The same school was the centre of a new movement in stage-designing which brought Wien to the front in this branch of the fine arts. The leading role which for centuries the Viennese Opera and playhouse took among European theatres accounts for the development of this speciality.

The geographical situation of Wien, which

made it the centre of so many primitive and imaginative races, became thus somewhat responsible for the artistic character of its inhabitants. Its climatic conditions were the stimulus which made Wien the model for the hygienic improvements of modern cities. The gusts blowing down from the hills bringing driven clouds of dust made it in former days a most unhealthy town. Tuberculosis was known as the "Viennese disease," raging especially among the poorer classes. This was changed and the disease stamped out by exemplary sanitary institutions, by clearance of the slums and elaborate housing schemes, erecting gymnasiums and swimming pools, public baths and playing grounds, and by



WIEN

1. The Schwarzenbergplatz. 2. Bomb-damaged buildings in front of St. Stephen's Church. 3. The University
Photos Keystone; Picture Post Library

planting and preserving large parks and a green belt around the city.

Centred in her capital city, Austria has been under Four-Power control (British, American, Russian and French) since 1945. This control runs smoothly because the four occupying Powers have little to do with the day-to-day affairs of the country: Austria has the only democratic government, in the Western sense, in the whole of central Europe to-day.

Resources and Industry. Although over half the population is rural, industry is important in Austrian economy. Neglected between 1919 and 1938 it was then developed by the Germans, which development will probably have left new foundations for the future.

Austria, for her size, is rich in natural resources. There are large iron-ore deposits in Steiermark. Extraction is cheap, for the ore is quarried rather than mined. This deposit of ore (of which production in 1950 was 1,860,000 metric tons) is the foundation of Austrian industry, Steiermark producing 99 per cent of the total iron and steel. Deposits of copper are found in Salzburg, the Tirol and Lower Austria, and lead and zinc in Kärnten. High-grade graphite is an important product. Lignite is mined in most parts of the country, but the Mur-Mürz valley is the richest area and produces two-thirds of the total annual output.

The metallurgical and engineering industries are the most important and these are divided between four areas. The Steyr region in the north Alpine Foreland specializes in small

goods such as cutlery, firearms and motor-cars; the Mur-Mürz valley in heavy industry such as the building of locomotives and rolling stock; the Wiener-Neustadt region, including Vienna, in agricultural and industrial machinery; and the Klagenfurt Basin in heavy engineering. The next most important industries are those connected with timber, for Austria is widely forested. Furniture and other wood products, pulp, cellulose and musical instruments are the most important manufactures. The textile trade has declined since the 1914-18 War, although cotton working and finishing is still important and employs about 70,000 people. The industry is concentrated in the Wiener-Neustadt valley.

Crude oil, mainly at Zistersdorf in the Soviet zone, is now very important. Its development was largely due to British companies which operated there before the last war. The decrease in mineral production generally in Austria after the war is due to the removal of plants by the U.S.S.R. (in whose zone of occupation lie the most highly industrialized areas). Oil refining and textiles are the only two industries which use imported goods in considerable quantities to-day.

In 1946 about seventy industrial concerns were nationalized, including the oil producing and refining companies, non-ferrous metal mining and refining, and the iron and steel industries. Railroad equipment, shipbuilding and electrical machinery and appliances were also affected.

Liechtenstein

LIECHTENSTEIN, one of the smallest independent states in Europe, lies between Austria and Switzerland along the right bank of the Rhine, being separated by the river from the canton of St. Gallen. On the eastern border of the principality is the Austrian province of Vorarlberg. The area is sixty-five square miles, and the population 13,750.

Except in the western areas, Liechtenstein is very mountainous, nearly the whole of the territory being covered by the spurs of the Alps. Along the Rhine waters, however, there is a narrow strip which is fertile enough to be used for agricultural pursuits. Here wheat is grown and also vines and fruits. There is some stock-raising and dairy farming. The mountainous area is divided by the Samina, which

flows into the Ill, a tributary of the Rhine. The highest peaks are in the south, these being the Falkais (8481 feet) and Naafkopf (8432 feet).

Cotton, leather, and pottery goods are manufactured. Some marble is quarried. Wood-carving is a further occupation. The people, who are largely German in origin, speak the German language. The majority are Roman Catholics.

Liechtenstein belongs to the Swiss Customs Union, and has had Swiss currency since 1921. Postal services are administered by Switzerland.

Vaduz, a town of about 2800 people, is the capital. Villages in the western and low-lying area are Balzers, Friesen, Schaan, and Neudeln. Two smaller villages, Eschen and Manern, lie to the north.

ITALY



RUINS OF POMPEII

The Temple of Jupiter and the Forum

Photo: E.N.I.T.

The Land and the People

Of all the countries in the world the easiest to draw, in outline, is Italy. The jack-boot, projecting into the centre of the Mediterranean, with Sicily as a kind of triangular football at the "toe," is familiar to everyone. The sole, instep, heel and graceful curve of the calf are all faithfully reproduced, and it is only at the knee, where the peninsula joins the mainland of Europe, that the similarity to a human leg ceases. The plains of Italy are almost encircled by mountains, the Alps creating a natural frontier barrier with France, Switzerland, Austria, and Yugoslavia, and the Apennines extending southwards and forming the backbone of the country.

In a country which extends for 700 miles from north to south, and with such varied contours, it is hardly surprising to find a wonderful variety of scenery and vegetation. Nestling at the foot of the Alps are the azure lakes and the rich, highly cultivated plain of Lombardy. To the east lies the Venetian lagoon; in the centre of the country is the great wine-growing region; then come the rolling hills of the Roman Campagna, and, finally, the stern mountains of the extreme south. The extensive coastline presents some of Nature's loveliest land and seascapes—sandy "lidos" alternating with rugged shores where the mountains approach the sea.



A HUMAN STATUE
A dancing girl of the Island of Capri in national costume
Photo. E.N.I.T.

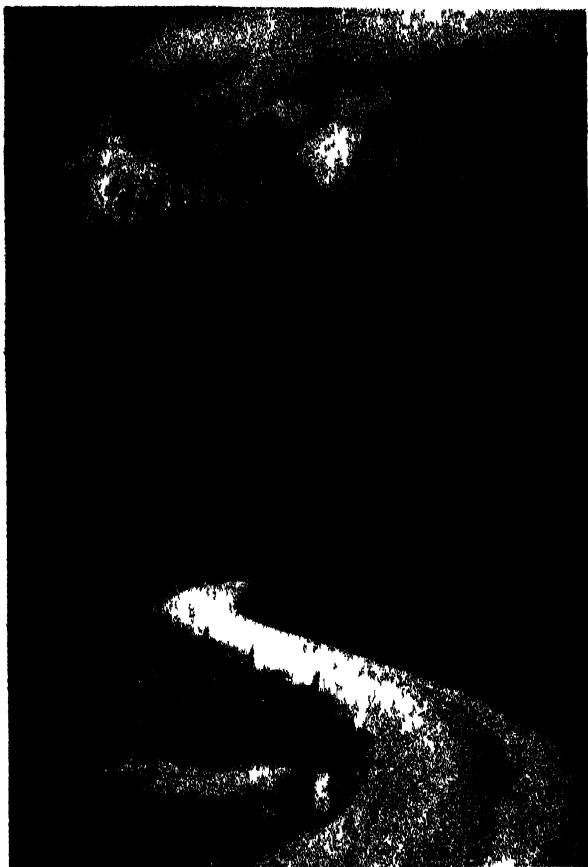
The total area of Italy is 119,759 square miles, i.e. almost two and a half times the size of England. This figure does not include the islands of Sicily (9900 square miles), and Sardinia (9300 square miles). The Italian Peace Treaty of 1947 gave certain Alpine areas to France, revised the Yugoslav frontier and made Trieste a free city. It also deprived Italy of her African possessions and of the Dodecanese Islands in the Aegean Sea.

It is interesting to note that Italy has a land frontier of only 1175 miles compared with a seaboard of 2500 miles; if we add the length of seashore around Sicily and Sardinia, this figure is increased to 4000 miles. The land frontiers are divided as follows: towards France 305 miles, Switzerland 460 miles, Austria 260 miles, and Yugoslavia 150 miles. The principal routes into Italy are: from Monte Carlo, along the Riviera, crossing the border near Ventimiglia; from Aix-les-Bains via the Mont Cenis Pass (or by rail through the Mont Cenis Tunnel) to Torino (Turin); from Lausanne or Berne via the Simplon Pass or Tunnel to Milano (Milan); from Luzern (Lucerne) via the St. Gotthard Pass or Tunnel to Milano; from St. Moritz via the Bernina Pass to Tirano and Milano; from Innsbruck via the Brenner Pass to Bolzano; from Wien (Vienna) via Tarvisio to Venezia (Venice); from Beograd (Belgrade) via Postumia to Trieste.

Mediterranean and Adriatic. The configuration of the western coast of Italy is determined by the wide curve of the Apennines, from which hundreds of off-shoots come close to the sea. Thus the whole coastline from Mentone (the French frontier town) to Genova (Genoa) and southwards to a little beyond Spezia, is a succession of sandy bays and rocky promontories. This shore is the Italian Riviera, and is divided into two parts by the important seaport of Genova; the portion to the west is called the Riviera Ponente, and that to the south-east the Riviera Levante.

Continuing southwards, the mountains recede from the shore; perhaps it would be more precise to say that alluvial deposits brought down from the hills by torrents have encroached into the sea, but the result is the same—the coast consists of long sandy beaches, some of which follow an unbroken straight line for ten to fourteen miles. The coast again becomes rocky towards Napoli (Naples), and practically the whole of the "toe" of Italy is mountainous.

Turning to the Adriatic side of Italy we find in the south that the mountains come fairly close to the shore, where there are two good harbours (Brindisi and Bari), but the central and northern parts consist of long stretches of sand, shelving gradually into the sea. In these parts the beaches are often eighty yards wide, and an average child of ten years



THE DOLOMITES

In the background are the jagged peaks characteristic of these mountains, in the foreground the motor-road which runs through their midst—afeat of engineering skill

Photo ENI

could wade out another hundred yards before the water reached shoulder-level.

The principal ports are Genova, Spezia (naval base), Livorno (Leghorn), and Napoli on the Mediterranean side; Palermo, Catania and Siracusa (Syracuse) in Sicily; Cagliari in Sardinia; Brindisi, Bari, Ancona, and Venezia on the Adriatic side. Before the war Trieste and Fiume were also Italian ports.

Within Italian territory there are two small independent states, the Vatican City and the Republic of San Marino. The Vatican City is the property of the Holy See and subject

to full Papal sovereignty. It covers nearly 109 acres and comprises the Vatican Palace and St. Peter's. San Marino is situated on a rock known as Mt. Titano, 2300 feet above sea-level, about twelve miles inland from Rimini (Adriatic shore). It covers an area of twenty-five square miles and is administered by an executive council, presided over by two "Captains Regent," who hold office for six months.

Outside the borders of Italy there is a small enclave belonging to the Republic—Campione (on the shore of Lake Lugano) which is surrounded by Swiss territory. The enclave of Zara used to belong to Italy but was ceded to Yugoslavia under the 1947 Peace Treaty.

Alps, Dolomites, and Apennines. It seems almost incredible that sunny Italy, a land always associated with palms and exotic flowers, was once partly covered with ice and snow. Yet such was the case. Thousands of years ago, during the Great Ice Age, glaciers extended from the Alps almost to the plains in much the same way as they do in Greenland to-day. These frozen rivers, pushed forward by the pressure of millions of tons of ice and snow, gouged deep ravines in the rocks. In their slow but purposeful journeys the glaciers accumulated masses of rock and "moraine" or gravel. At the terminal points of the glaciers mighty rivers gushed forth carrying the moraine with them. Gradually, as they reached flatter ground and flowed less swiftly, the gravel was deposited. Thus was formed the plain of Lombardy, the most fertile area in the whole of Italy. The mighty glaciers have now diminished and in place of the torrents which raced towards the sea we have the easy-flowing River Po. So great was the quantity of moraine brought down by some of the glaciers that it accumulated in enormous dumps at points where the ice melted, thus blocking the valleys. Where this occurred, we now have those fascinatingly beautiful lakes—Orta, Maggiore, Varese, Como and Garda.

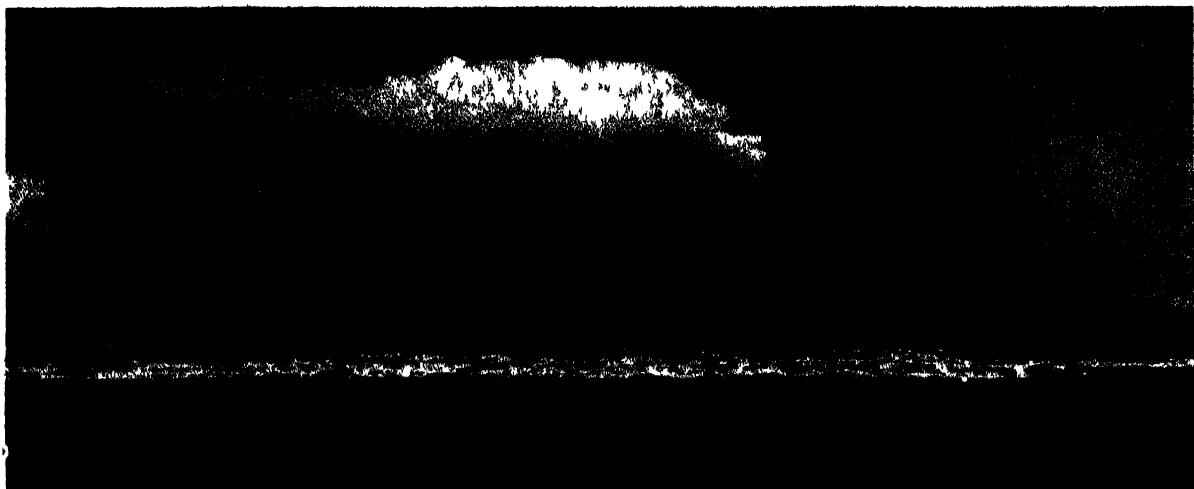
Between Italy and France rises the summit of Mt. Blanc (15,782 feet), the highest peak in the Alps, while between Italy and Switzerland are the Matterhorn (or Monte Cervino, in Italian—14,837 feet), and Monte Rosa (15,217 feet).

To the east of the Alps lie the Dolomites, magnesian limestone formations which once formed part of the sea-bed. These reefs were pushed upwards by the wrinkling of the Earth's crust and nowadays there are many peaks

12,000 feet above sea-level. The limestone is friable and fairly easily washed away by the action of storms; a boulder or stratum of rock, harder in texture than the surrounding limestone, will act as a kind of umbrella, protecting the lower strata from erosion. Some very strange effects are obtained in this manner; sometimes the Dolomites appear as grim fortresses; at others they resemble cathedral

an island of the Aeolian Archipelago, which rises straight out of the Mediterranean Sea about fifty miles to the north of Messina. The lower slopes of Vesuvius and Etna are extremely fertile. Nothing grows upon lava, but the ashy deposits have rendered the ground particularly suitable for the cultivation of the grape-vine, orange and lemon trees.

The three volcanoes vary considerably in



MOUNT VESUVIUS
Photo Fox

spires, outlined against the blue sky, and around Bolzano there are whole areas which can be likened to the pinnacles which adorn the cathedral of Milan. The word "Dolomite" is derived from the name of a Frenchman, Monsieur Dolomieu, who explored the region during the second half of the eighteenth century.

The Apennines are of limestone which, disintegrated by weathering (hastened by indiscriminate deforestation), have formed sharp, jagged crests. They are, however, much lower than the Alps, the highest point being the Gran Sasso (literally "Big Stone") 9800 feet above sea-level.

The mountains of Sardinia are similar in structure to those in the southern part of France. In fact, a long time ago, Sardinia and Corsica once formed part of the mainland of Europe, being joined, not to the peninsula of Italy, but to France.

The Volcanoes. The only active volcanoes in Europe are in Italy; one cannot conceive Napoli without Vesuvius, and Sicily would cease to be the Island of Myths without Etna dominating the landscape. The third and most consistently active volcano is Stromboli,

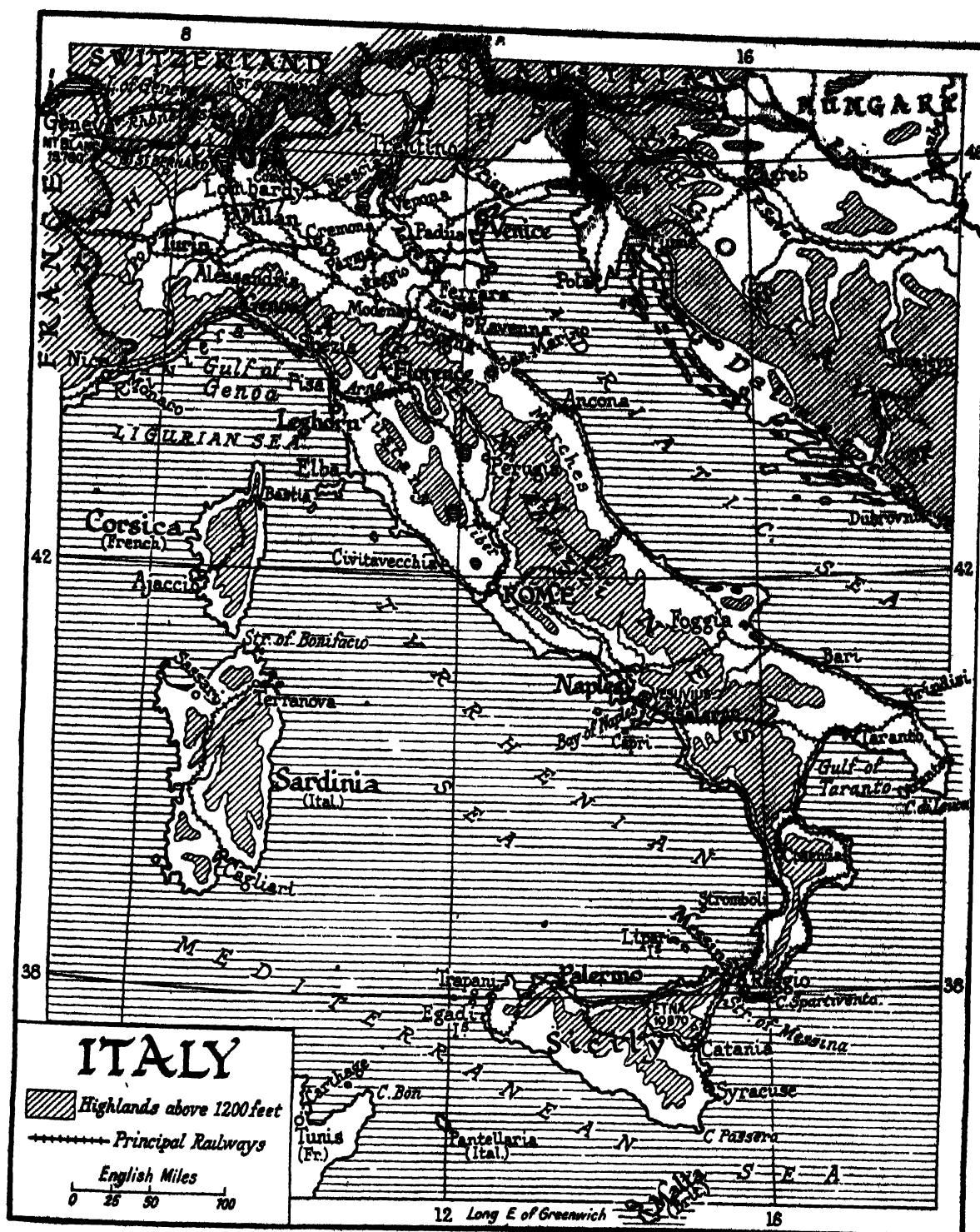
size and altitude. Etna, the largest, is 10,755 feet in height and forms a circular cone nearly twenty-five miles in diameter; on the sides of the main crater there are about 200 subsidiary ones, all more or less active. Vesuvius is one of the smallest active volcanoes in the world; at present it is 3890 feet high, but before the big eruption of 1906 (when the upper cone was shattered) the rim of the crater was 4200 feet above sea-level. It is a popular belief that Pompeii and Herculaneum were destroyed by lava; fortunately this is not the case; they were buried (and to a certain extent preserved) in volcanic ashes.

Stromboli is one of the Lipari (or Aeolian) Islands which lie to the north-east of Sicily. The volcano consists of a single cone 3038 feet in height and normally there is a minor eruption every hour or so. At night time it is usually possible to see red streams of molten lava descending more than half the distance from the cone to the sea.

Rivers and Lakes. In such a long, narrow and mountainous country as Italy, it is not surprising that the rivers are, for the most part, unnavigable. The longest is the Po (420 miles) which rises in the Monte Viso, near Torino,

ITALY

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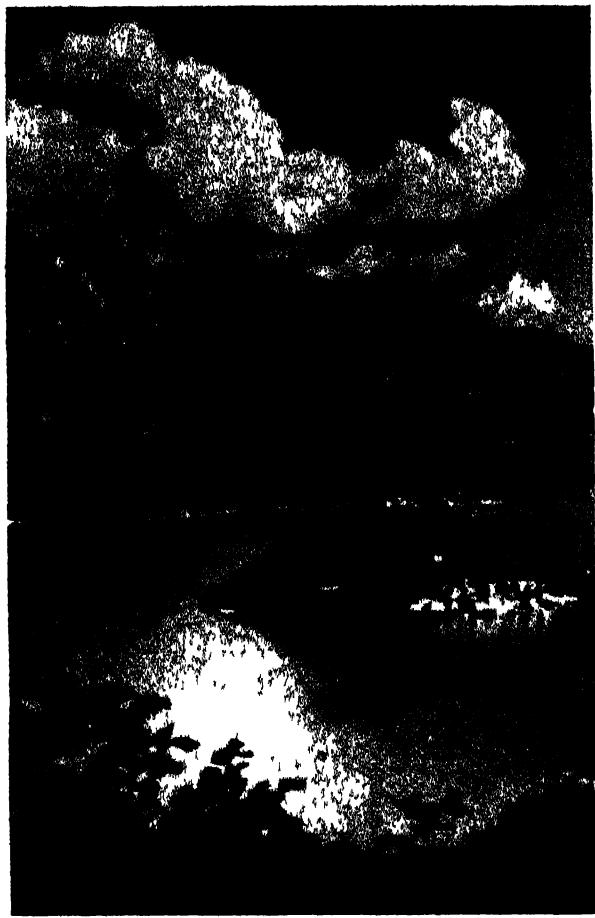


ALTERNATIVE PLACE NAME SPELLINGS

Florence = Firenze; Geneva = Genève, Genoa = Genova; Leghorn = Livorno; Milan = Milano, Naples = Napoli;
Syracuse = Siracusa, Turin = Torino; Tyrol = Tirol; Venice = Venezia

and meanders across the plain of Lombardy, emptying its waters into the Adriatic Sea in the delta region between Venezia and Ravenna. Next in length comes the Adige (255 miles) which starts in the Dolomites, not far from Bolzano; it flows southwards swiftly to Verona, where it turns east and runs parallel with the Po to the Adriatic.

The other principal rivers are all more or



LAKE COMO

Photo: Topical

less torrents—the famous Tiber (244 miles) on which Roma is situated; the Adda (195 miles), Tanaro (171 miles), and Ticino (152 miles) which are tributaries of the Po; the Arno (154 miles) which passes through Firenze (Florence), and the Piave (137 miles) which flows from the eastern Dolomites to the north Adriatic.

In the delta region of the Po and the Adige the embanking of rivers plays an important part. Silt has accumulated to such an extent that at Ravenna, for instance, the normal

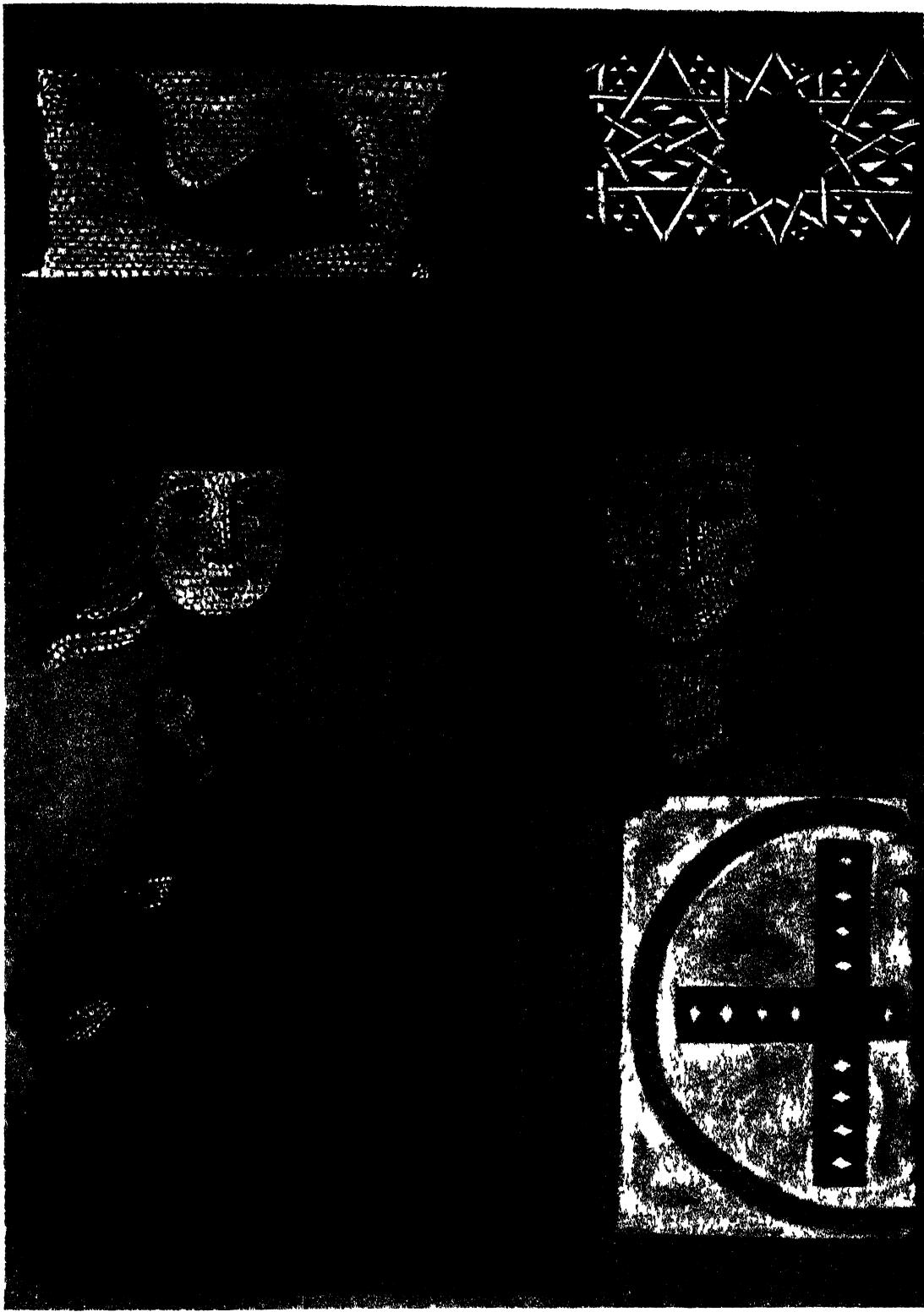
height of the river is level with the second storey of the houses. The rivers continue to push forward their deposits; the little town of Adria (once an important seaport which gave its name to the whole Adriatic Sea) is now sixteen miles in a direct line from the coast and twenty-five miles from the mouth of the Po. Ravenna, also a port in years gone by, is now linked with the sea by a canal six miles in length. No large river discharges itself into the sea at Venezia, which continues to be a seaport of major importance.

It is interesting to compare the flow of water in the River Po during the different seasons of the year. The average is about 2000 cubic yards per second (near the mouth); in the autumn this is reduced to about 220 cubic yards, but in the spring, when enormous quantities of snow melt rapidly, the flow is sometimes 7500 cubic yards per second.

The glacier-formed lakes of northern Italy are important as tourist centres, but little used as waterways for transport of goods. The largest of all the lakes is Garda, the southern end of which is ten miles wide; the longitudinal measurement is thirty-two miles, and the northern end penetrates into the mountains at the point where the Alps and the Dolomites meet. The area of this inland sea is 143 square miles, which is approximately the size of the Isle of Wight. To the north of Milano is a group of six large lakes—Orta, Maggiore, Lugano, Varese, Como, and Iseo—and scores of smaller ones. The Swiss-Italian frontier divides Lugano practically in half and passes through the northern ends of Maggiore and Como.

Maggiore is the largest of this group of lakes, with an area of eighty-two square miles; Lugano, Varese and Iseo are each about twenty square miles in extent and Orta covers only half this area. As already explained, these lakes have been formed by glaciers gouging ravines in the mountains—hence it is not surprising that the average width is less than two miles and in no part does it exceed three miles. The Italian lakes were famous at the time when Roma was at the height of its power; Pliny, Virgil, and many other famous men in history had villas on their shores. Each lake is supremely beautiful in its way: Garda gives an impression of grandeur and majesty, Maggiore of beauty and serenity, Como of charm and loveliness.

Apart from the Lombard lakes, there are few others of importance in Italy. The formation of Lake Trasimeno, in the centre of the



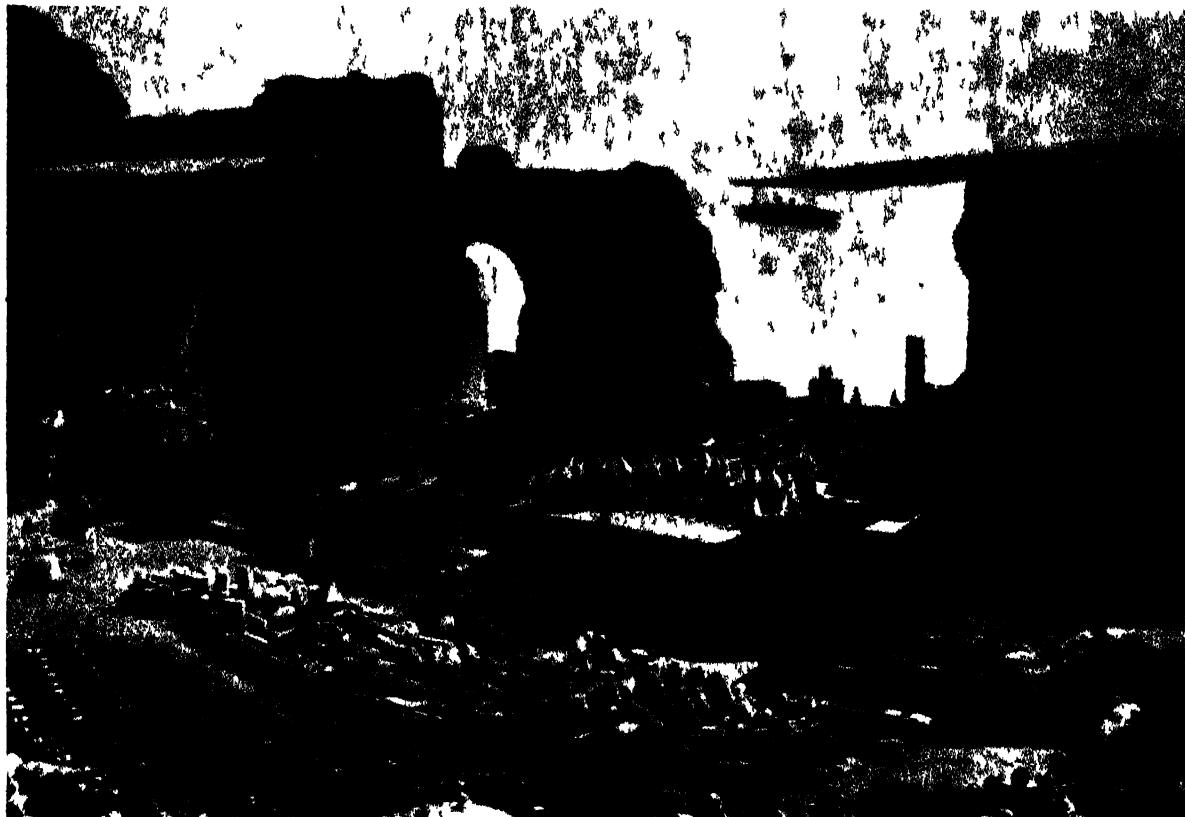
ITALIAN MOZAICS

- 1 Part of a mosaic paving from a Roman villa of the third century B.C. 2 Marble mosaic with red and green porphyry dating from about 1170 to 1190 3 Head of a Roman lady from St. Mark's Cathedral, Venice, dating from about 1300 4 Head of a saint from Ravenna dating from the twelfth century 5 Figure from the "Birth of the Virgin" from Orvieto, probably by Orcagna (1316-1376)
6 Marble inlaid with mosaic dating from the latter half of the thirteenth century

country, is probably due to a geological dislocation, but the majority of the lakes in the south occupy craters of extinct volcanoes.

Climate. The climate of northern Italy—i.e. the Alps, the Dolomites, and the Plain of Lombardy—presents a striking difference from that of the remainder of the country. The north is climatically similar to the remainder of Europe, with a slightly higher average

is practically non-existent, and boys and girls often grow to a mature age before they see any snow. There are heavy rains in the autumn, but December and January are ideal months. Sudden changes in temperature are liable to occur in the spring and cool winds from the north alternate with the damp *Sirocco* from the south. This latter wind is most unpleasant: it comes from the Sahara Desert and accumu-



SICILY

A performance being given in the Greek Theatre at Taormina among the ruins of the original building

Photo Italian Lines

temperature; in winter cold winds blow from the mountains and Milano and Torino often have heavier snowfalls than London; in summer the Valley of the Po is frequently too hot to be comfortable and certainly too hot at midday for manual labour.

The climate of the remainder of the country—central and southern Italy—is tempered by the influence of the sea. It must be remembered that at no part does the width of the peninsula exceed 220 miles, and by far the majority of towns are within fifty miles of the coast.

Southern Italy, Sicily, and Sardinia have a typical "Mediterranean" or sub-tropical climate. Winter, as we know it in England,

lates moisture as it passes across the Mediterranean Sea. The average yearly rainfall diminishes as one travels from north to south. Even in the coastal areas around Sicily precipitation rarely exceeds three inches, and the high table-land in the centre of the island is virtually a desert. In summer one frequently sees whole trains of water-tank trucks conveying the precious liquid into the hinterland.

Vegetation. The difference in climate between the north and south of Italy exercises a striking effect on the vegetation. For the purposes of review it is convenient to divide the country into five regions—the lowlands of the Alps and Dolomites; the Plain of

Lombardy; the Ligurian Riviera; central Italy; and the south in which Sicily can be included.

The foothills of the mountains are not highly cultivated; olive trees grow in fair numbers, and oranges and lemons are produced along the shores of Lake Garda. There are a good number of mulberry and almond trees and a few pomegranates.

The Plain of Lombardy is one of the most fertile regions in Europe. As already mentioned, it consists of alluvial soil and almost anything needing a warm climate combined with a fair amount of water will grow there. Maize is the principal product, but in recent years large areas between Milano and Brescia have been devoted to the cultivation of rice. The fields are divided, not by hedges as in England, but by rows of olive trees from which vines are strung in festoons. For the most part the land is divided into small holdings, conducive to the production of a variety of different crops. Thus, in addition to maize (which forms one of the staple foods of the Italians), vines and olives, one often finds small patches of sugar cane, a dozen or so lemon and peach trees, maybe a fig tree or two, as well as pasturage for animals. In some regions the cultivation of the sugar-beet is encouraged by government subsidy.

The Ligurian Riviera is responsible for the production of many exotic shrubs and plants, but because of the proximity of the mountains to the sea it is impossible to cultivate crops to any appreciable degree. Orchards extend up the valleys, and the lower hills are silver-grey with olive trees. Every inch of ground is utilized by means of terracing the slopes and a fairly considerable quantity of grapes is produced. One of the principal industries is the cultivation of flowers and hundreds of tons of carnations, violets and roses are sent every year to the north European capitals.

In the dry climate of central Italy green pasturage is predominant. Myrtles, rosemary, and other herbs grow profusely, and the finest olive oil is produced in the neighbourhood of Lucca. Large quantities of chestnuts are obtained from this part of Italy. In recent years the alluvial soil between the Mediterranean and the Apennines—a strip fifty or sixty miles long and varying in breadth from two to six miles—has been developed (with government aid) and now forms one of the principal grain producing areas of the country.

The vegetation of southern Italy is sub-tropical. Wheat is grown extensively in the Roman

"Campagna", and the Pontine Marshes—now drained and no longer malarial—produce grain as well as dairy produce for the capital. Sicily is famous for its citrus products—oranges and lemons. Large areas are devoted to the cultivation of almond and fig trees. The centre of the island is, for the most part, barren, and the only plant which grows without trouble is the cactus. Papyrus (which we usually associate with the River Nile) grows on the banks of a small river near Siracusa.

Fauna. The original fauna of Italy has long disappeared, its place having been taken by domestic animals. Ox-breeding is still carried on in the Valley of the Po, and the ass and the mule are to be found everywhere. The few wild animals which remain are chamois and ibex in the Alps (now preserved by stringent laws), and a species of boar in the Gennargentu Mountains of Sardinia.

Attempts are now being made to re-stock the lakes and rivers with trout and other fresh-water fish. Intensive fishing in home waters of the Mediterranean has resulted in driving the fish to other areas. The tunny fishing industry, off the coast of Sardinia, is fairly profitable.

Communications. Italy is certainly not lacking in good transport facilities. Since the days of the Romans the Italians have been famous as road-makers, and many of the roads over which the legions of Julius Cæsar and Augustus tramped two thousand years ago are still in use to-day.

In 1928 a central organization assumed control of 12,737 miles of main thoroughfares. Only those who knew the condition of Italian roads at that time can realize the magnitude of the task involved in reconstruction, but the work was completed in five years and a further 93,000 miles of secondary roads have since been rebuilt. Italy was the first country to construct "autostrade"—speedways for the exclusive use of motor traffic. Most of the motor roads are in the north of the country and these have now been linked together to form a continuous highway from Genova to Trieste—from the Mediterranean to the Adriatic.

Some of the mountain roads are magnificent examples of engineering skill. In a motor tour of a hundred miles, it is no uncommon thing to cross three or four mountain passes 7000 feet above sea-level. (You will remember that the summit of Snowdon is only 3560 feet.) The highest motor road in Europe is the Stelvio, 9000 feet high, and the ascent from the southern side is negotiable by numerous hairpin bends.

The principal Italian roads are named after the ancient Roman Proconsuls—the Via Aurelia, which follows the Mediterranean coast from Roma to the French frontier, the Via Flamina from Roma to Ancona on the shores of the Adriatic, and so on. Sometimes the modern tar-macadam thoroughfares over which motors speed so smoothly run parallel with the ancient roads, surfaced with stone slabs, over which formerly chariots rumbled.

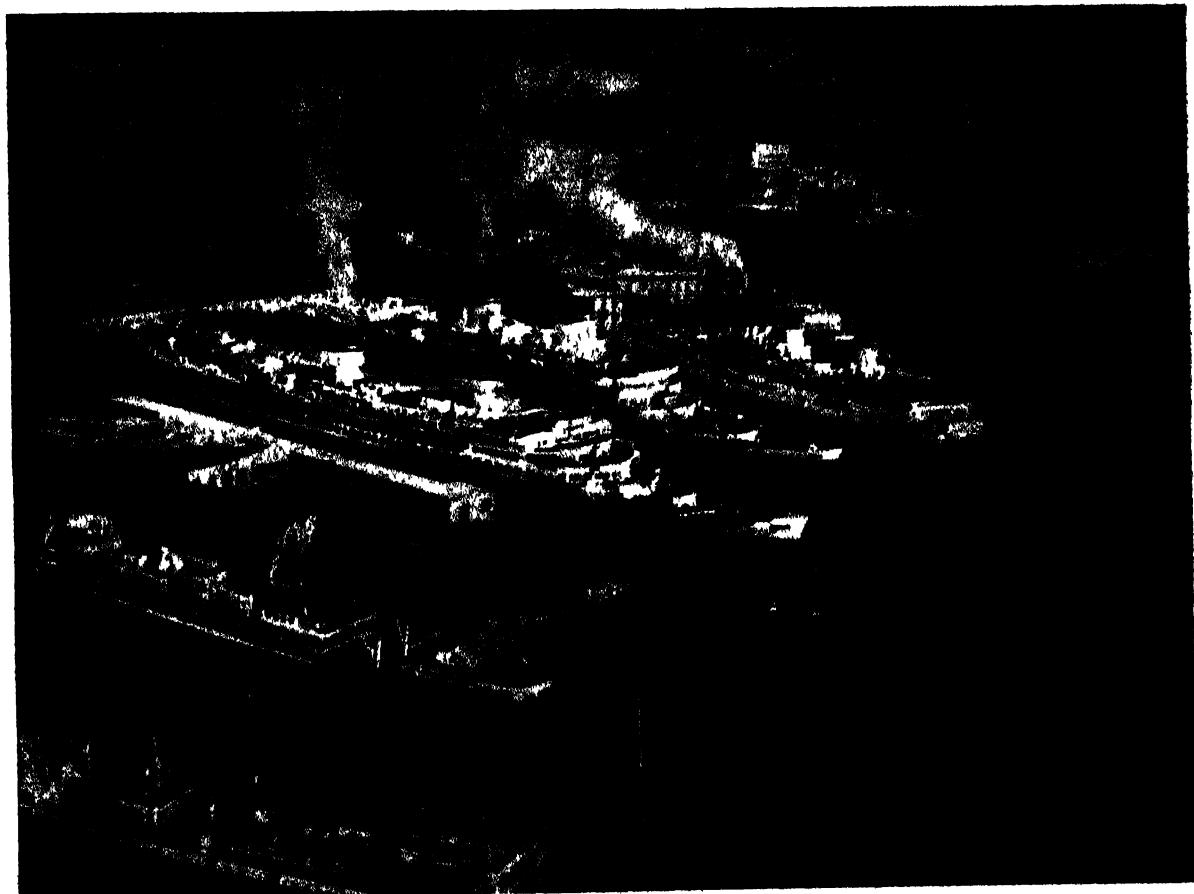
Railways. The railways were also reconditioned during the Fascist regime. Altogether there are about 13,500 miles of railway owned by the State, including lines in Sicily and Sardinia. On account of the mountainous nature of the country the construction of railways has been fraught with difficulty. Tunnels are numerous everywhere except in the Plain of Lombardy. Entering Italy by rail from the north one passes through tunnels of considerable length—the Mont Cenis (8½ miles) on the main line Paris-Torino, the Simplon

(12 miles—the longest in Europe) and the St. Gotthard (9½ miles) on the main lines from Switzerland to Milano. Another tunnel (11 miles) was constructed through the Apennines, between Bologna and Firenze in 1934.

Most of the main railway lines are now electrified, the power being supplied by hydro-electric generating stations in the mountains. Italy produces practically no coal and before electric traction was adopted, many thousands of tons of Welsh coal were imported annually.

Under the 1947 Peace Treaty Italy agreed to co-operate with France in building a new railway line between Briançon and Modane via Bardonecchia. However, she is to waive all customs duties, passport formalities, etc., for both passenger and freight traffic travelling on this line from one point in France to another, across Italian territory.

Shipping. As may be expected from a



GENOVA
Ocean-going liners in the port
Photo: Italian Lines



NATIONAL TYPES

Above: Peasants in national costume at Sorrento. Below: Girls taking part in the Festival of the Grape in Roma

Photos: E.N.I.T.

country whose shores and land frontiers are in the ratio of four to one, Italy depends to a very great extent upon sea-borne trade. From the Adriatic ports of Venezia and Brindisi, Italian liners sail to all parts of the eastern Mediterranean, Egypt, India, East Africa, and the Far East. The Mediterranean ports of Genova and Napoli are concerned principally with traffic to North and South America and to South Africa, but there are also sailings from these ports to Australia.

Air Lines. The mountainous nature of Italy renders travel by rail a relatively lengthy

business. Although the average speed of passenger trains is by no means low, the lines twist and turn to such an extent that the actual distance travelled is out of all proportion to the distances between cities, as seen on the map. Thus it happens that aeroplanes perform the journey from Milano and Venezia to Roma in about one-sixth the time taken by the fastest trains.

The principal air routes into Italy from the north are from München to Milano, München to Venezia and from Paris to Torino.

The People. Until modern times "Italy" was merely a geographical expression. Unity only came in 1870. The people of the north differ from those of the south to a much greater degree than do the Scots and English, and in order to understand these differences it is necessary to delve a little into the history of the country.

Prior to the formation of the Roman Empire, the only people who possessed any semblance of culture were the Etruscans, who came from the East and settled in Tuscany, and the Greeks who colonized Sicily and the regions now known as Puglie and Lucania in the "heel" of Italy. Little is known regarding the Etruscans—they left practically no literature and very few monuments—but the Greek influence is still a prominent feature of the

extreme south. It has been said that Sicily was once more Greek than Greece itself, and judging from the marvellous temples to be found at Segesta, Selinunte, Agrigento, and Siracusa, there is no reason to doubt this statement. There is, too, a marked racial similarity and in outlandish villages in the mountains of Calabria the dialect spoken is still more Greek than Italian.

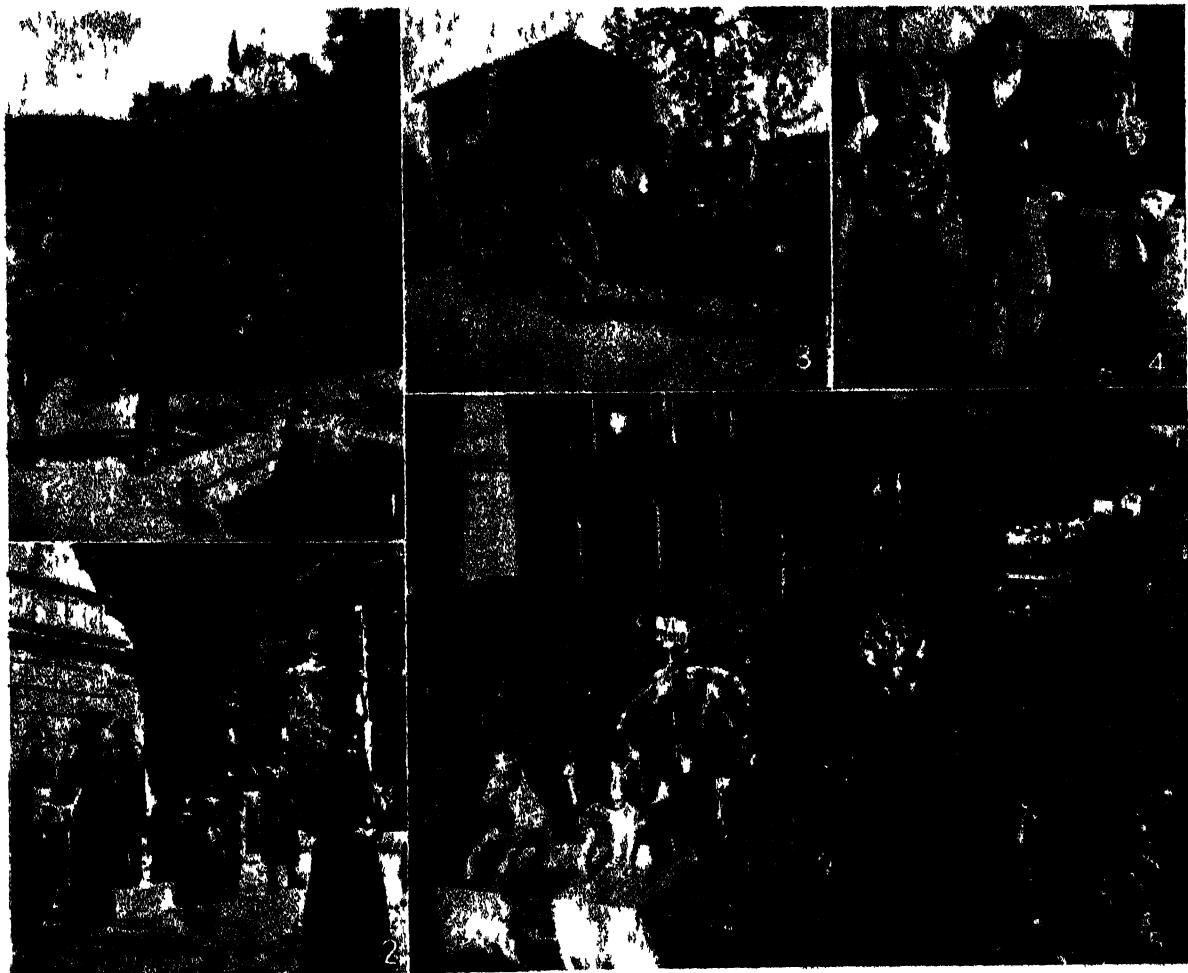
After the fall of the Roman Empire, Italy was overrun by barbarians and in the year 800 the greater part of the country became part of the empire founded by the Frankish

king Charlemagne. Later, the central part of the peninsula was nominally included in the Holy Roman Empire, but in reality it was divided into a number of independent states. Some of these, such as Venice and Genoa, were republics. Naples was a kingdom. In others, such as Florence and Milan, members of rich families, or soldiers of fortune, established themselves as hereditary rulers.

In medieval times—in fact, until the beginning of the nineteenth century—the fertile Plain of Lombardy was continually overrun by peoples from the north; these were not merely marauding bands who took what they could and returned to their own lands laden with spoils. Campaigns took longer in those days and invading armies sometimes stayed fifty years or so, until a stronger army came or until events at home required their presence

In the second half of the last century, Italy again became a united country under Victor-Emmanuel, King of Sardinia. In 1915 Italy entered the First World War on the side of the Allies, and in 1919 she received certain parts of Austria (notably the south Tirol and the region around Trieste) as the price of victory.

In 1922 Mussolini came to power, bringing a wealth and a unity unknown before. Italy entered the Second World War on the side of the Germans in 1940, but surrendered to the Allies in 1943. Until 1945 she was the battlefield for the hardest-fought campaign of the war, and emerged shattered and exhausted. In 1946 the king abdicated and the country became a republic. In 1947 she lost her colonies, certain Alpine lands and the territory around Trieste as the price of defeat, but kept the South Tirol. But the nation is



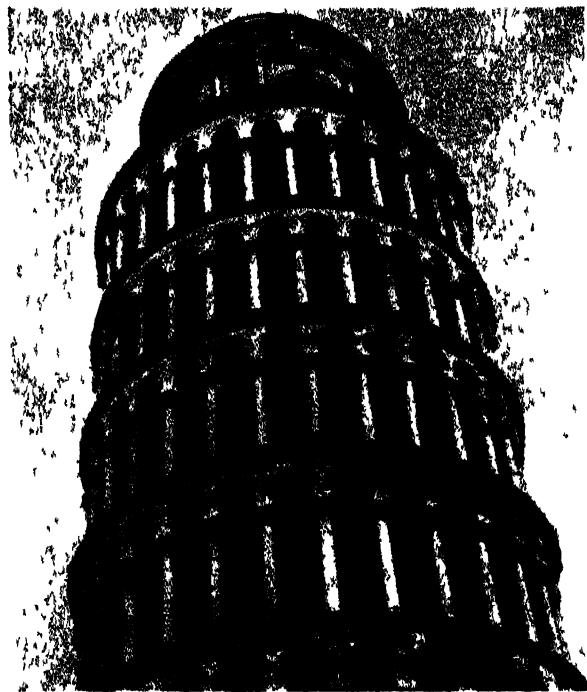
THE PEOPLE OF ITALY

1. A woodman with his donkey, familiar beast of burden. 2. Peasants at a well in the Apennines. 3. Scene on a road near Napoli.
4. Native costumes of the Campo Bassa. 5. The Feast of the Grape Harvest in Roma.

Photos: Wide World; Central, Topical; E.N.I.T.

fundamentally a complicated fabric and the language and customs still differ throughout the land.

Let us now take an imaginary journey from north to south. If we cross the frontier from France and stay for a few days on the Italian Riviera, in one of the charming mountain valleys in the Alps, or in Torino, we shall certainly be understood if we speak French.



THE LEANING TOWER OF PISA
Photo E.N.I.T.

Should we first enter the country by way of Austria, then German will be more readily understood than Italian. To the east of Bolzano is a region, known as Ladinia, which has only comparatively recently been opened up by motor-coach services; here the Ladin tongue is spoken—a language different from both German and Italian.

At Venezia and in the province of Veneto (which extends westwards as far as Verona) we come into contact with many "foreign" words of obscure origin. Most of these were introduced into the Venetian vocabulary by traders at the time when the city dominated the whole of the Adriatic and the greater part of the eastern Mediterranean.

Continuing southwards we come first to Tuscany and Umbria, where the purest Italian is spoken, and then on to Roma. This central part of Italy, which once formed the region

known as the Papal States, has suffered less pollution from the infiltration of foreign languages and customs than any other part of the country.

So far the characteristics of the people vary slightly. With the exception of the south Tirol the inhabitants of the north and centre of the country are, as a rule, true to Latin type. They are slightly smaller, physically, than the average English man or woman; their skins are, of course, well tanned by the sun and, as a rule, their hair is dark, although in the north one often meets people who are as fair as the average German or Englishman. All classes are industrious and the city-dwellers have a high general level of intelligence.

Italians engaged in industrial or agricultural labour work harder, for longer hours and for much less pay than the average British working man. They require less to eat than we do; meals usually consist of vegetable soup, maize (*polenta*), *pasta* (macaroni in one form or another), fruit and wine. Meat is a luxury; even quite well-to-do people have it only once or twice a week and the peasants only taste it on *festa* days. The reason for this scarcity of meat in the diet of the Italian people is partly economic, but principally climatic; strong sunshine supplies the body with many of the dietetic properties contained in meat.

In the south of Italy and in Sicily there is a marked change in the type of people, due to the colonization of these regions by Phoenicians, Greeks, Saracens, and the domination for 200 years (sixteenth and seventeenth centuries) by the Spaniards. In fact, it would not be difficult to be understood in Napoli by speaking pure Spanish. The southern Italians are very voluble but actually they can carry on quite intelligent conversations without speaking a word. Their gesticulations are amusing to watch and there appears to be a sign for most human requirements.

South of Roma there are also changes in temperament and physical appearance. Carelessness and oppression on the part of foreign rulers have produced idleness and ignorance among the populace. The alertness and hard-working qualities of the northerners are lacking amongst the southern Italians. Improved conditions of housing, sanitation, etc., are gradually producing a greater measure of self-respect, but it will be many generations before the southerners will be in a position to be compared favourably with their brothers in the north.

We, who live in colder climes, are inclined to be tolerantly amused at the fact that Italians have a siesta, or midday rest. We are apt to interpret this break in the working day as laziness, but this is not the case. The Italians start work much earlier than we do; labourers in the fields are to be found ploughing (with teams of oxen) or tending their vines at five in the morning; bank clerks and Government officials work from 8 a.m. to 12 noon and from 2 p.m. to 6 p.m. in the winter or from 3 p.m. to 7 p.m. in the summer.

The Fascist Era. In 1922 Benito Mussolini and his supporters took control at a critical time, when the fortunes of the country were at an extremely low ebb. They took for their emblem the Roman "fasces" (a bundle of rods tied around an axe) and became known as Fascists. It was a remarkable regime at home but its political aspirations eventually ruined the country.

This book is not concerned with politics, except in so far as they affect the destinies of the people. From the moment that Mussolini assumed control a change came over the whole nation. Despair gave place to hope, and hope to realization. Mussolini preached the doctrine that personal sacrifices were necessary in order to attain law, order, and eventual prosperity. Enthusiasm for the new regime swept the country and by 1930 Italy became a first class European Power.

Every branch of human activity was organized by the Fascist leaders. Sports were encouraged; huge stadia were built and nowadays every town has its football field, tennis club, swimming pool, etc. Numerous public works were undertaken; the roads, which were in an appalling state, were reconstructed; archaic railway stock was replaced and many trunk lines electrified; new ships were built and fast air lines established. The vast programmes of public works called for a great expenditure of money which, miraculously, was forthcoming. Increased taxation was met with a spirit of stoicism and great endeavours were made to reduce the adverse trade balances by the consumption of goods produced within the country in preference to those imported from abroad. Every Italian workman had to join a "Corporation"—an organization which controlled conditions of labour and arranged the scale of wages. A supreme body known as the "National Council" reconciled the interests of employers and employed.

Education. The Ministry of National

Education had jurisdiction over all schools and educational establishments in Italy. There were six "departments"—elementary, technical, secondary, superior, antiquarian, and classical. Private schools were encouraged, but they were subject to control by the State.

The full course of elementary education covered a period of eight years. Secondary schools were divided into three grades: (a)



NAPOLI
A memorial arch embellished by beautifully moulded statues
Photo: *Italian Lines*

those destined to complete the elementary education of pupils compelled to start manual labour at an early age, (b) schools for the preparation of pupils for technical professions, and (c) schools of culture and science.

There are twenty-one universities in Italy, ten of which belong to the State; these are located in Bologna, Cagliari (in Sardinia), Genova, Napoli, Padua, Palermo (in Sicily), Pavia, Pisa, Roma, and Torino. The Fascists set up "culture institutions" in all towns and were responsible for over 5000 workmen's libraries throughout the country.

After leaving secondary school, young workpeople were enrolled in the "Dopolavoro" (literally "After-work") organization. The function of the Dopolavoro was to control the leisure hours of young people, i.e. to provide sport, entertainment, and further education. Membership of the Dopolavoro, though compulsory, carried with it many advantages.

Young people were able to participate in sports which otherwise they might not have been able to afford (swimming, rowing, gymnastics, skiing, etc.) and to attend first-class concerts and opera at very low fees.

The Cities. Roma is one of the world's most wonderful cities. At the height of the Roman Empire, during the reign of Augustus, it must have presented a marvellous sight. From its seven hills could be seen the Forum, the Colosseum, the markets of Trajan, the Marcellus Theatre, and the Patrician villas. All the principal buildings were faced with shining marble; the marble has now disappeared and many of the noble columns lie on the ground, but nevertheless the remains of the Imperial City, the centre of the ancient world, still indicate the magnificence of Rome during the times of the mighty Cæsars.

Modern Roma, a city of 1,665,670 people, has extended far beyond the original walls (which, for the most part, still stand). Huge blocks of modern flats have been built to accommodate labourers, junior government officials, etc., who once lived in insanitary dwellings in the centre of the city. In the suburbs of Roma a "University City" has been built and nearby are two stadia, a magnificent swimming pool, a medical research institution and a training school for teachers.

Close to the Tiber is the Vatican City, the official residence of the Popes of the Holy Catholic Church. The Vatican itself is the greatest palace in the world, having over 4000 rooms. St. Peter's, the largest church in the world, was begun in the fifteenth century and finished in 1667.

Close to the mouth of the Tiber, some ten miles distant from Roma, lies the ancient port of Ostia, which can be described as the "Tilbury" of Roma. It was at Ostia, in olden days, that grain ships from Egypt discharged their cargoes. When the Roman Empire fell, Ostia was neglected, and mud and silt from the swiftly flowing Tiber covered the sea front. For some years past excavations have been systematically carried out at Ostia Antica (as the old port is known) and the ruins now exposed are almost as interesting as those of Pompeii.

Napoli. The great seaport of Napoli, 134 miles to the south of Roma, is always considered in conjunction with its marvellous bay, which gives an incomparably lovely setting to the city.

Although much has been done in recent

years to improve Napoli, by demolishing insanitary buildings and constructing wide thoroughfares and open spaces, it is by no means a city of beauty. The expression "See Naples and die" (which originally meant "You must see Naples *before* you die") has become a hoary old joke upon the unsavoury smells emanating from its back streets.

Throughout Italy the poorer people seem to spend a great deal of their waking hours in the streets, but in no part is this custom more noticeable than in Napoli. Tables and chairs litter the sidewalks and whole families have their meals *al fresco*. In the midst of civilization, many quaint customs still prevail. The milkman, for instance, drives a herd of goats from door to door, and customers are thus assured of having perfectly fresh milk.

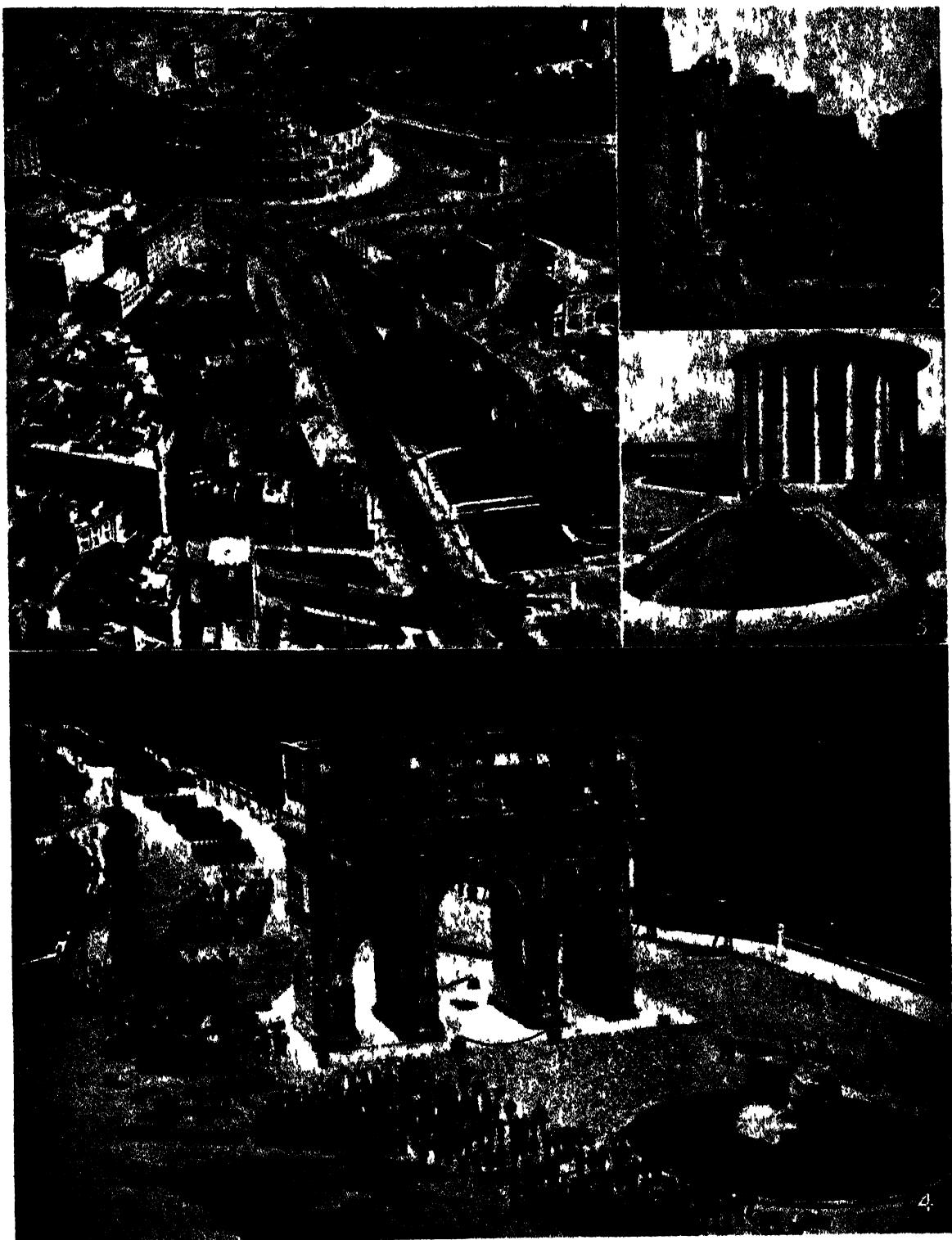
Compared with Roma, this city of 1,029,800 inhabitants has little to offer of outstanding merit, but the surroundings are intensely interesting. First of all there are the cities of Pompeii and Herculaneum, which had remained buried for more than eighteen centuries.

At each extremity of the Bay of Napoli lies an island—Ischia to the north and Capri to the south. Both are very beautiful, but it is the latter that is most famous. Throughout history it has been a pleasure resort.

Venezia. The origin of this fascinating city, built upon a collection of small islands, is shrouded in mystery. Picture the Goodwin Sands, those treacherous mud-banks which, in normal tides, are only just covered by water and are partly visible at low tides. Imagine that they were some two or three yards higher and you have the site that Venezia is built upon.

According to history (or rather according to the commonly accepted version of it) the row of sand-banks running parallel with the north Adriatic shore was inhabited until the fourth century A.D. by a few hardy sea-faring people. Between 408 and 567, Alaric and his Visigoths forced the inhabitants of the mainland to take refuge on the islands. Thus we have to thank vandals for the creation of Venezia.

For a time Venezia became part of the Empire of Byzantium, and it was the connection with Constantinople (now Istanbul), coupled with the maritime trade with the Near East, which gave the oriental tinge which is to be found in the city's style of architecture, and, in particular, to the taste for mosaics. In the course of the eleven centuries during which



ROMA, THE CAPITAL CITY

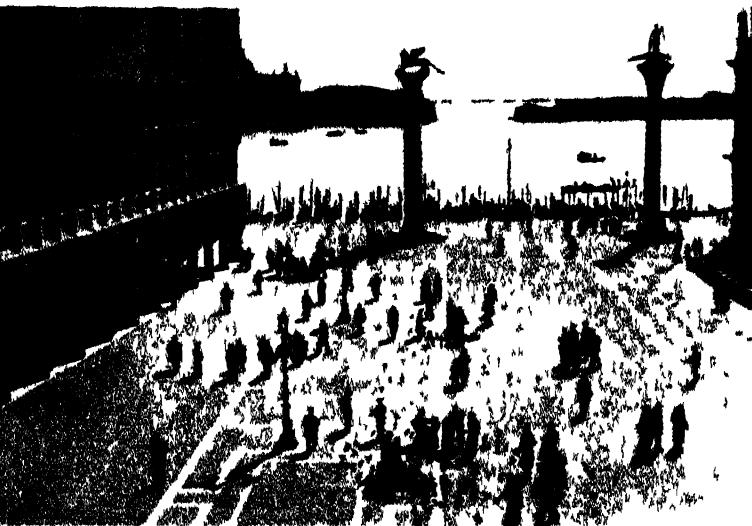
1. Aerial view of the Colosseum, showing the Via dei Fori Imperiali and Via S. Gregorio Magno 2. Ruins of the Forum, dating from the Roman Republic. 3. The Temple of Vesta. 4. The Triumphal Way

Photos E.N.I.T.; Wide World

Venezia was an independent republic, the island city derived her wealth from the sea. Throughout the Middle Ages Venezia practically monopolized the carrying trade of the Mediterranean and to a great extent controlled the finances of the then western world.

There are now two bridges from the mainland town of Mestre to Venezia, one for rail and the other for road traffic. The quiet of

Venezia. Her port, the second largest in Italy, is some distance away from the Grand Canal; the railway terminal and the huge garage (accommodating 3000 cars) at the end of the motor road, are well to the back of the city. In the Lagoon, which separates the city from the mainland, there are three fair-sized islands—Murano, Burano, and Torcello. The first is where the beautiful Venetian glass is made;



VENEZIA

*Left The Bridge of Sighs. Right The Piazetta from the porch of Saint Mark's
Photos: Blue Star Line, Fox*

Venezia never fails to surprise the visitor arriving for the first time. One receives a slight shock upon arriving from the station to find, not taxis and motor-buses, but gondolas and small motor-boats. One knows that Venezia is a city of canals, yet it is impossible not to be surprised in finding that it really is a city where streets are non-existent. Although wheeled traffic is conspicuous by its absence, there is a bewildering maze of *calli* (or alleys) and there is not a house in the whole city that cannot be reached on foot. The city is built upon seventy-two islands which are joined together by some four hundred bridges.

The "hub" of the city is St. Mark's Square at one end of which is St. Mark's Cathedral, surmounted by many cupolas; the interior walls, ceilings, and domes are completely covered with mosaics. To the right of the cathedral is the famous Doge's Palace, behind which are the prisons. Connecting the Palace with the Prison is a small bridge, known as the Bridge of Sighs, since those who were condemned to the dungeons knew that there was no return.

Modern life has not spoilt the beauty of

the second is famous for its lace; and the third has an interesting church and campanile (tower). Beyond Venezia, to the south, and to a certain extent protecting it from the Adriatic Sea, lies the Lido, probably the most famous bathing resort in the world.

Milano. The capital city of the province of Lombardy, has over 1,250,000 inhabitants, and in size and importance is second only to Roma. For hundreds of years it has been the business centre of Italy; it was the bankers from Milano who gave the name to Lombard Street in London.

The most prominent building is the Gothic cathedral, which was begun in 1336 and took five hundred years to complete. It is reputed to be the second largest church in the world, and is adorned with hundreds of pinnacles and no less than 3288 statues. Outstanding among all other buildings in Milano is the Sforza Castle, which dates back to the fifteenth century. A great deal of this massive structure was, however, built at a much later date and the castle is now used as a museum. Milano is the home of opera. The famous Scala

theatre is by no means an imposing building, but it is the ambition of every famous singer to perform there.

Firenze. The capital city of the province of Tuscany is famous throughout the world for its wealth of medieval and Renaissance buildings. It is situated amidst the Apennine foothills, on the banks of the River Arno. The famous Ponte Vecchio, though badly damaged by shell-fire, was the only bridge to escape demolition during the 1939-45 War.

Firenze is generally considered to be the cultural centre of Italy; certainly the purest Italian is spoken in the province of Tuscany, and it was from here that the Renaissance spread over Europe. The principal building in the city is the cathedral, but it is art galleries

and museums, such as the Pitti Palace and the Uffizi, which attract most people to Firenze.

In nearly all parts of Italy, past traditions are kept alive by the re-enactment of events which took place many hundreds of years ago. One of these is of particular interest, for it is the first recorded game of football. In 1530, when Florence was being besieged by the Imperial troops, the nobles of the city showed their contempt for the enemy by organising a football match in the square of Santa Croce, which was under fire from guns mounted on a hill outside the walls. The revival of the historic event takes place twice a year in the Piazza della Signoria, the central square of the city, with the players dressed in 16th century costume.

Italy as a Productive Unit

THE traveller who leaves England by air for India or South Africa crosses the whole of France almost in a straight line from north to south. Then soon after Marseilles, the route turns east and after two hours flight over the Mediterranean one is over the Italian Isle of Elba, near the coast of Tuscany. Elba, of course, one immediately connects with the name of Napoleon, but visions of the past are quickly effaced, and Elba to-day is chiefly noted for its iron ore, an important source of raw material for the Italian metal industry.

The flight continues over the centre of the Italian Peninsula. For a while the country gives the appearance of a golden bar hung between a blue sky and a blue sea. No white cliffs, and at first, no green pastures. Then, all at once, a land intensely coloured and a series of lakes of volcanic origin, seemingly perfectly round. On one of them, the Lake of Bracciano, the airliner comes to rest. Roma is only a few miles away and the port of Napoli, the terminus for an important traffic to America, is within easy reach. The tourist traffic moves north to the great lakes and the industrial centres, towards the frontiers of France, Switzerland and Yugoslavia.

Agriculture. Agriculture is Italy's most important industry. The total area of the country is approximately 119,759 square miles and the total area under agriculture of some sort in 1950 was 61,637 square miles. Italy is naturally an agricultural country for she is much favoured

by soil and climate. These are so varied over the length and breadth of the land that she is able to grow all the European crops within her borders.

Although Italy is naturally an agricultural country it was not until the advent of the strong Fascist government that agriculture was organized or controlled. In the north, favourable conditions and new improvements such as roads, railways and education had contributed to make the district prosperous after the unification of 1870, but elsewhere crop diseases, inefficient fertilization, taxation and economic depression led to many hardships. By 1885 acute depression had settled on these areas and the people were driven to emigrate. After the first World War things began to improve. The Fascists aimed to make Italy self-sufficient, to cut down imports and to raise exports. This policy was further expanded after 1935 following her attack on Abyssinia, when the League of Nations passed economic sanctions upon her. Agriculture, being the greatest industry, had a large part to play in attaining this self-sufficiency. Technical improvements were introduced, new fertilizers were exploited, economic help, training and education were given to the farmers and peasants, land was reclaimed from marsh and bog, and rural houses were built or improved.

Any objective survey of Italian agriculture will readily show what the country has been capable of in the past and what it will again be



capable of in the future. The 1939-45 War, however, left its mark upon Italy, destroying equipment and houses and upsetting much good agricultural land as well as leaving economic chaos in its wake.

Crops. In 1925 Italy had to import 2,400,000 tons of wheat—about one third of her total requirements. This did not suit Fascist policy and so a national "Battle for Wheat" campaign was started. In ten years, by 1935, the campaign had been so successful that only 155,555 tons were imported. This meant that Italy was producing about 7,000,000 tons herself. Rice had always been a staple export crop and while with wheat the object was to increase production, with rice the object was to increase consumption. About 600,000 tons are harvested in a normal year.

The cultivation of so-called "Industrial Crops" grew in importance between the wars. Hemp is a valuable export and Italian hemp is used the world over for rope-making. In 1950 the country produced 66,400 tons of hemp fibre. Sugar

beet has been cultivated since the nineteenth century and has increased steadily in importance, production being, in 1950, as much as 4,470,000 tons. It has given rise, too, to an important sugar-refining industry. Tobacco—a state monopoly—also supports a large industry and much is also exported.

Other vegetable and root crops supply the home market and the surplus goes for export and to the relatively new and important canning industry. In 1950, 3,268,000 tons of potatoes and 1,448,000 tons of tomatoes were harvested.

Wine-making was becoming increasingly important under the Fascists. As in France, wines have always been made by the peasant and farmer for their own use, a few of the better brands attaining international fame. As, however, the country is so well-suited to fruit growing both in climate and soil and as agriculture was recognized as the chief industry, wine-making was made to grow in importance. In 1938 the value of the wine produced was a quarter of

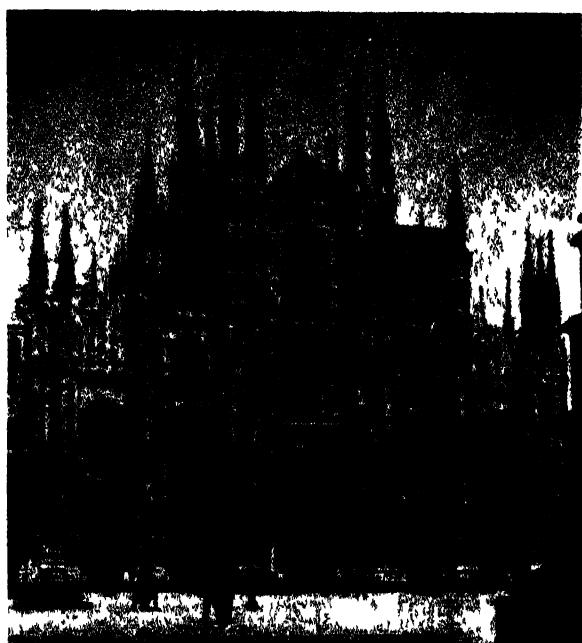
the total of the rest of Italian agricultural production. Italy is second to France in the quantity produced—in 1950 it was 36,825,300 hectolitres. Until the second World War much work was being done to improve quality, to standardize the types of wine and to make the industry of more commercial value.

Nuts, chestnuts and cherries are other fruits which are valuable exports. The cultivation of peaches is extensive—about 300,000 tons per season. Most of these are shipped to England to arrive just when the season for South African fruit is finished. They are to be found on London barrows during the summer. Olives are widely grown in Apulia, Calabria, Tuscany and Sicily. This has founded a flourishing olive-oil industry, and in 1950 the annual production was 1,500,000 quintals.

Citrus fruit cultivation is another widespread occupation, carried on in most parts of the country, generally by small growers under difficult conditions.

Production of citrus fruit during 1950 was

nearly 1,000,000 tons; but to quote figures is to convey little. One should see how the work is done and travel along the coast of Amalfi and other districts in order to realize what citrus fruit cultivation really means. The growers had to build up (and the word should be understood in its literal meaning) their "gardens" by propping the earth with walls along inclines which rise from the shore at



THE CATHEDRAL OF MILANO

Photo: P J Green

gradients of forty-five degrees. They are usually very sheltered from the winds and fully exposed to the sunshine, and the lemons gathered from these gardens have an exquisite fragrance, hence their name of *primo fiore*, or first flower of the crop. Sicily has a yearly crop of citrus fruit equal to three-quarters of the national production and could easily greatly increase this quantity if only a larger supply of water were available.

Land Reclamation. The existence of unhealthy expanses of swampy land has for centuries been a cause of loss of both life and wealth. But the problem of reclaiming lands appeared to involve at least 17 per cent of the entire country and this was startling in its immensity. For centuries the Roman Campagna had challenged Rome's greatness with its malarial miasma and its barrenness. It had successfully defied Emperors and Popes. Today it has been conquered. This has been done not by a process of lessening the existing

difficulties, but rather by magnifying the problem and then facing the difficulties in their complexity. The name of "*bonifica Integrata*" (that is to say comprehensive reclamation) was the clarion call to action which implicated not only the execution of systematic drainage and irrigation, but also the construction of roads, aqueducts, schools, farm dwellings and buildings of all kinds. The work executed, or in the process of execution, has met the needs of southern Italy, Sicily, and Sardinia; a great deal is also being done in the north.

Plans exist for the eventual reclamation of more than 16,000,000 acres. It is interesting to note that in one single year the Pontine Marshes produced crops which included 15,000 tons of cereals, 20,000 tons of beet and an increasing farm stock of 20,000 head of cattle. [Other benefits were felt in various ways as the land became available, thus allowing the transfer of groups of farmers and their families from the overcrowded districts of the north. Incidentally it also helped the tourist traffic.]

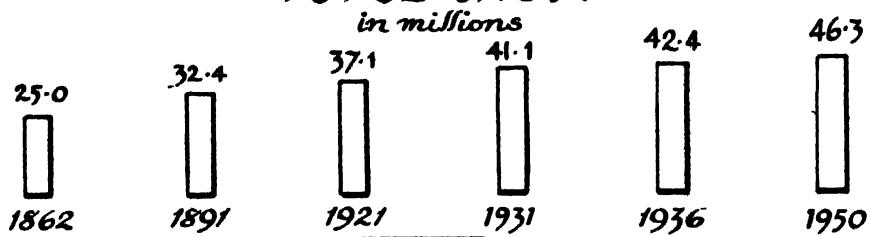
Land Tenure. Nearly 9,000,000 people, that is to say about 47 per cent of the working population, are engaged in agriculture.

In general, land is held under four different systems. Smallholdings (anything of about one or two acres) which provide a living for a peasant and his family are generally found in hilly and mountainous districts and are usually cultivated for vines or citrus fruits. Two forms of tenancy are found in the Po valley and in Tuscany, Umbria and the Marches. Under these systems the farmer is independent and self-supporting, working with his family alone, without the help of hired labour. Only in the south do large estates still exist where labourers are hired by bailiffs in the absence of the owners.

The general will to make the very best of what Nature is offering is evident to the observer not only in the southern districts or in the affable looking countryside of Tuscany. One could soon find other instances when looking at the cultivation of flowers along the Riviera, where innumerable small spaces of land have been converted into gardens and hot-houses, intensively worked and carefully defended from the sea and the winds. In general, one should also keep in mind the fact that of the whole area 22,000,000 acres are in mountainous regions and that only about 15,000,000 acres are plains; and yet not less than 50 per cent of the country is worked in one way or another.

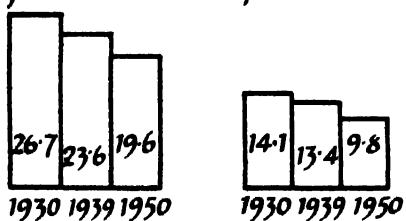
ITALY

POPULATION



VITAL STATISTICS

Births per 1,000 Deaths per 1,000



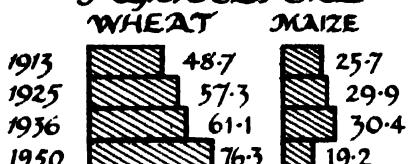
OCCUPATIONAL DISTRIBUTION

in percentages of total number of persons gainfully employed



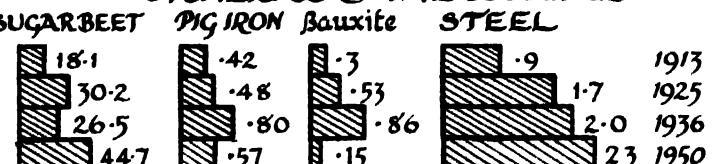
PRODUCTION

AGRICULTURE



In millions of Quintals

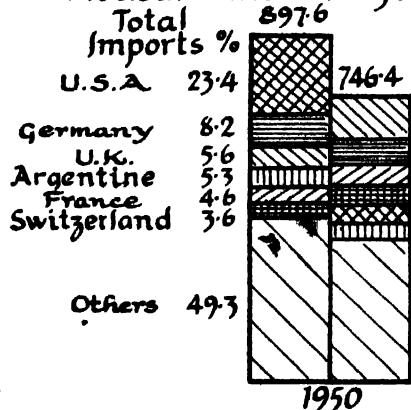
MINERAL & INDUSTRIAL



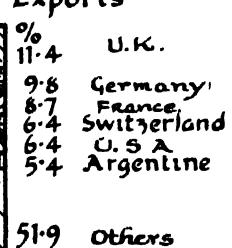
In millions of Tons

IMPORTS & EXPORTS

Foreign Trade by Countries in thousand millions of Lire



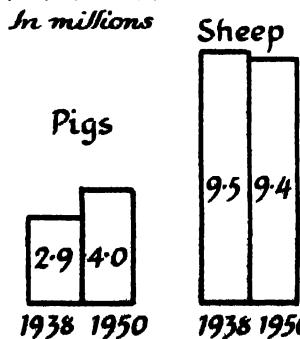
Total Exports %



NATIONAL INCOME

in thousand millions of Lire
6,323

LIVESTOCK



Mineral Resources and Industries. Italy is predominantly an agricultural country, but her industries have grown rapidly. This growth was stimulated by the Fascists—again in execution of their policy of self-sufficiency. Industry was enabled to grow so rapidly by the rich mineral resources of the country and by the vast power made available in the early part of the century by the erection of hydro-

than a passing reference. The resources in iron ore are notable: 40,000,000 tons of ore immediately available, plus a further reserve of 100,000,000. The metallic content of the ore, however, is poor and much iron ore must be imported. Italy holds a prominent place in the production of iron pyrites, which is mainly used for making fertilizers, and the output in 1950 was slightly under 900,000 tons.



FIRENZE

Left: The Piazza of the Duomo. *Right:* The Loggia della Signoria, showing the characteristic architecture of a city which is one of the most famous in the world for the beauty of its buildings

Photos: E.N.I.T.

electric generating plants. This movement of growing industrialization will not lessen the fundamental importance of agriculture. Moreover, Italy has no great clusters of urban population comparable with Greater London or with Birmingham: industries in Italy are numerous and important, but they are distributed over a very large area. Geographical conditions account for this, inasmuch as agriculture supplies several raw materials, such as hemp to the weavers, cocoons to the silk spinners, fruit and vegetables to the canners, and beetroots to the sugar factories.

Italy has important sources of supply for aluminium, and iron ore, pyrites, mercury, and sulphur, zinc and lead. The mining of sulphur is very extensive, especially in Sicily, where it keeps over 60,000 workers employed. In addition, there are important deposits of pumice stone, colouring earths, barytes, talc, graphite, and asphalt. Italian marble and graphite are too well known to need more

One of the aluminium ores is bauxite, of which Italy has rich deposits totalling 32,000,000 tons, excluding the large deposits in Istria now beyond her control. Two other kinds of aluminium ores are described as leucite and aluminite, and of the latter there are still larger reserves in the old volcanic regions of central Italy estimated at over 100,000,000 tons. For the production of the metal, two new plants were constructed in the 1930s, one in the new industrial district of Bolzano and the other at Porto Marghera. Thus, during 1950, the production of aluminium reached 37,000 tons, a quantity which may well be surpassed in the future in view of the new uses found for this metal. An interesting feature of this industry is its consumption of electric power, reckoned to be about 8 per cent of the national output. Electrical power, in Italy, is obtained from hydro-electric installations exploiting the water basins of the Alps and Apennines.

An older source of energy, however, should

be mentioned before the production of electricity, that is to say coal. Coal of very fine quality has not been found in Italy, but there are several hundred million tons of quite good coal available in the northern mining districts and in Sardinia. Even when supplemented by the production of lignite, however, the total amount available provides only a fraction of the country's requirements.

Oil prospecting has been carried on for some time in several parts of Italy, but, as the initial results were somewhat limited, new impulse was given to the hydrogenation of the lignite and of the crude oils imported from the wells of Albania. Two important hydrogenation plants had been erected by 1938, one at Bari (for the treatment of oils) and a second one at Livorno (for the working of the lignite of central Italy). Other sources of fuel have been obtained through processes of distillation of plants and asphaltic schists.

The most recent development is the discovery of enormous natural supplies of methane—a gas with nearly three times the calorific value of coal gas—mainly in the Cortemaggiore area. By 1952 over 1000 steel works, power stations, textile mills and other plants in the north were working exclusively on methane, and it has even been suggested that within a few years Italy's dependence on imported coal may be negligible.

The wider scope given to an ever-increasing number of natural resources and energies has stimulated Italian industry in more than one way. The exploitation of bauxite, for instance, for the manufacturing of aluminium on a larger scale, necessitated the erection at Bolzano of a new plant for the making of synthetic cryolite and of another one for the production of electrodes. In addition this rise of the manufacture of aluminium to the position of a great industry involved a strong increase in the production of hydro-electric power. In general, this instance, and others that could be easily quoted, will show how natural energies were utilized by the Fascist planners in order to serve particular needs; but it also proves that they greatly contributed to the reshaping of the economic activity of the country.

Employing Natural Steam. As an interesting example of skill and persistence in seeking new sources of energy, one case could now be mentioned. At Lardarello, which is in Tuscany, a firm developed the generation of electric power by using the violent eruptions of steam and gas which followed a perforation of the soil of volcanic origin. After several years of

experiments it was at last found possible to control the steam and to convey it to the generating station through a system of pipes. The production of power at Lardarello before the 1939–45 War reached 100,000,000 kilowatt-hours, and was rapidly expanding as it had an immediate employment in the Italian State Railways systems.

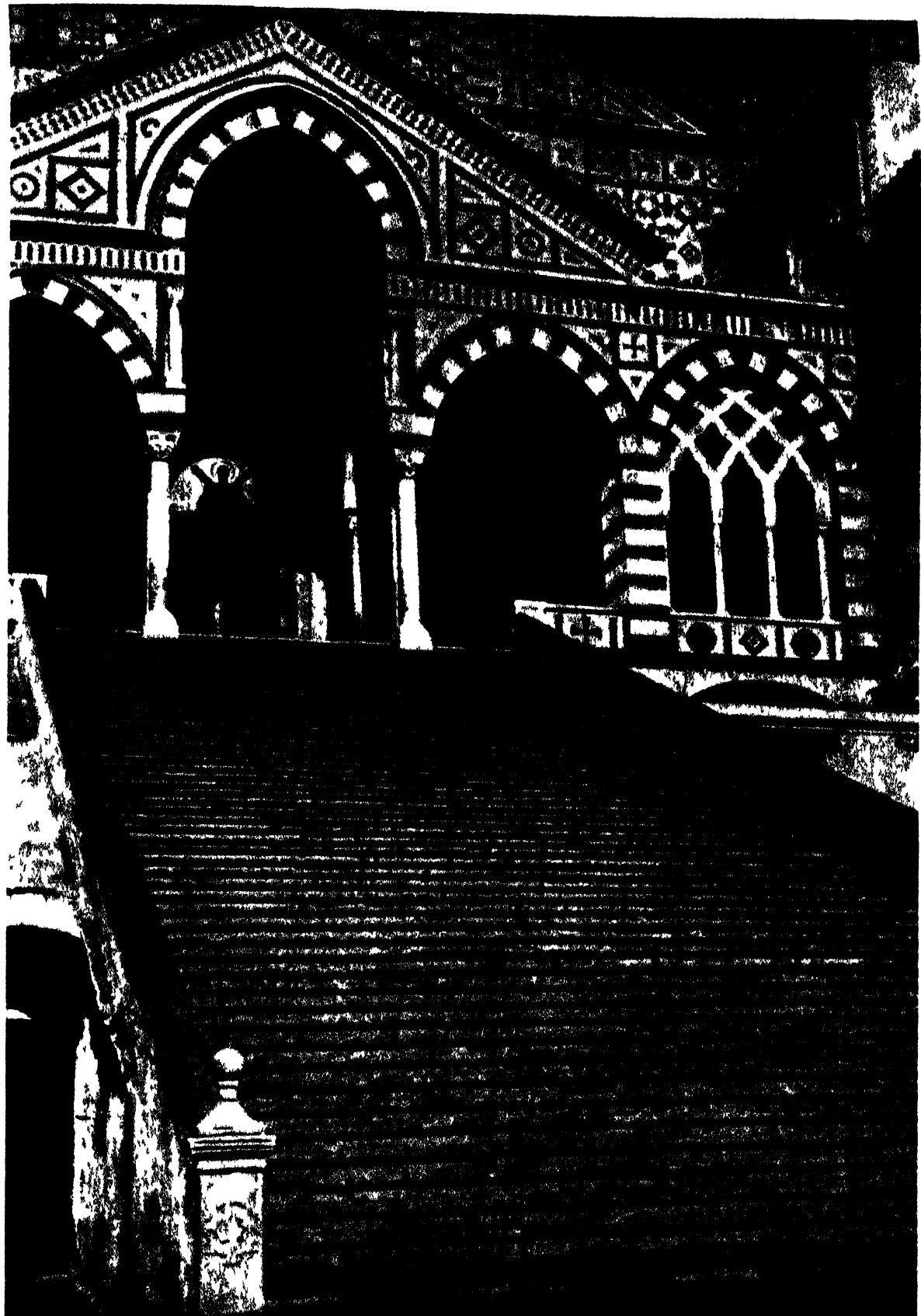
Hydro-electric Power. Hydro-electric power, which has had a rapid development in Italy, is one of the most important sources of energy. Power is distributed by cable throughout the whole of the country. Most of the installations are in the north and gave an output in 1950 of 21,500,000,000 kilowatt hours. Although many of the Alpine areas that generate hydro-electricity were transferred to France under the 1947 Peace Treaty, their output is still available to Italy.

The existence of a vast system of generation and transmission of power has been a strong incentive to the development of several branches of industry, for example, the manufacture of electrical machinery. There are about ten large concerns engaged in this line (besides many smaller and less important firms) all of which manufacture generating equipment, transformers, converters, and all kind of motors. Other mechanical and engineering industries include cable manufacturing and the production of aeroplanes and motor-cars.

There are three big and important plants for the production of cellulose. One of them, situated at Foggia, southern Italy, derives its raw material from the straw supplied by the wheat growers of the district. Soda and chlorine (which are required in the "Pomilio" process used) are obtained by treating the salt mined in the neighbourhood. The necessary electric power is generated at the power station in Calabria and the water, because of the dryness of the region, is obtained from artesian wells.

Textiles. Silk, wool, cotton, hemp, and modern staple fibre are manufactured on a large scale, and two-fifths of the requirements of the population are satisfied by home supplies.

The silk industry dates back many centuries. Local farms supply the raw material to the mills, and in an average season about 1,600,000 spindles are kept busy spinning the raw silk produced from cocoons of the silkworms which have been fed on mulberry tree leaves. The weaving is carried on in the districts around Lake Como, Lombardy, where



STEPS AND GATEWAY TO THE DUOMO PALACE AT AMALFI
Photo E. NIT

specialized labour is available. In normal times there are about 32,000 looms operating in this industry, which give employment to some 40,000 workers. Hemp is supplied by agriculture to the textile factories for home and export markets. In 1950 the production figure approached 70,000 tons. Modern processes enable the fibre to be treated in such a way that

employment to not less than 150,000 men and women.

The wool and cotton weavers are supplied with large quantities of imported raw material. Two-thirds of the cotton spinning mills are situated in the plains of Lombardy and give employment to 200,000 workers. The wool industry employs about 100,000 workers.



THE ITALIAN ALPS

Hanging woods descend from the rocky peaks and make a perfect setting for two castellated residences near Merano

Photo E.A.T.

it can be spun and woven on cotton spindles and looms.

In the field of artificial textile fibres (long and short filaments) Italy is the largest producer and exporter in Europe. In 1950 production was on a basis of approximately 4 lb. per head of the total population of the country and the output amounted to over 100,000 tons, of which two-fifths were staple fibre, and the balance rayon. Taking into consideration the activities subsequent to the making of the yarns (spinning, weaving, and allied trades) this group of industries covering the production and processing of artificial fibres gives

Chemical Industries. Another rapidly growing industry is the chemical, which may be considered to-day a valuable asset to the country, inasmuch as it supplies a large number of raw materials and semi-manufactured articles. It takes third place amongst the principal Italian industries, being preceded only by the electrical and building trades. About three-quarters of the farmers' needs for fertilizers and copper sulphate is drawn from this source. The production of synthetic nitrogen is a fascinating modern development, as it utilizes a raw material that nature has lavishly bestowed upon all the countries of the world, i.e. air.

Two of the most important methods of production of synthetic ammonia (hydrogenation of nitrogen) were invented in Italy, and large plants were established—principally in northern Italy—which even before the war accounted for an output of ammonia of more than 70,000 tons per annum. As regards phosphatic fertilizers, the potentiality of this industry is considerably greater than the demand.

The requirements of the home market are also amply satisfied by the manufacture of soda, alcohol, and inorganic acids. The production of synthetic dyes has been increasing steadily. The manufacture of pharmaceutical products is also being fully developed.

Other industries which usually play a less important role, but are nevertheless of moment in the economy of the country, inasmuch as they, too, draw their supplies from native agricultural resources, are the canning and dairy industries. The latter is concentrated mainly in the north where the best meadow land is to be found. The number of cattle in the country was reduced by about 30 per cent

between 1942 and 1945. A new impetus was given to this industry by an invention in the 1930's for the manufacture of artificial textile fibre known as *Lanital*, which is produced from casein, a by-product of milk. This fibre is sometimes described as an artificial wool.

The canning of fruit and vegetables has made great strides in recent years and now necessitates the cultivation of over 192,000 acres, and the employment of approximately 50,000 workers in the fields and factories. The annual production is equal to some 150,000 tons (principally peeled tomatoes and tomato purée) and approximately half this quantity is exported.

The production of sugar is taken care of by the beetroot which is extensively cultivated in central and northern Italy. Fifty-two factories account for an output of 600,000 tons of sugar per annum, all of which is devoted to home consumption.

Building. Another very important need of the people—that of housing—is satisfied by the vast group of building trades which in 1951 was responsible for the employment of nearly



AUGUSTA HARBOUR, SICILY

B.O.A.C. flying boat at rest

Photo: B.O.A.C.

700,000 workers. The expenditure in the last fifteen years before the second World War for public work alone totalled £350,000,000, and this figure does not include work carried out on behalf of municipalities and provinces. The following figures give some idea of the extent of the work of re-organization undertaken to house the population: during 1932-36—five years of general international and economic unrest—new dwellings were erected providing accommodation totalling 650,000 rooms. During the three years following the war (1946-1948) accommodation totalling 299,292 rooms was built. The production of cement in 1950 reached 5,000,000 tons per annum.

In conclusion, and in regard to the general location of industries in Italy, as previously mentioned, it should be noted that the three most important provinces are Lombardy, Piedmont, and Venezia. Lombardy, with Milano as the principal centre, is at the head with half a million workers and some three thousand factories. Piedmont has about half as many workers, and the province of Venezia about one-third. This distribution is accounted for by the existence of large consuming centres in the areas, and by the proximity of the export markets in France and central and eastern Europe.

Italy's imports (1950) were valued at slightly over 897,600,000,000 lire, of which 23·4 per cent came from the U.S.A., 8·2 per cent from Germany, and 5·6 per cent from the United Kingdom. Exports amounted to approximately

746,400,000,000 lire, of which 11·4 per cent were bought by this country, 9·8 per cent by Germany, and 8·7 per cent by France. The unfavourable balance is counterbalanced by other sources of income, one of which is the increased tourist traffic.

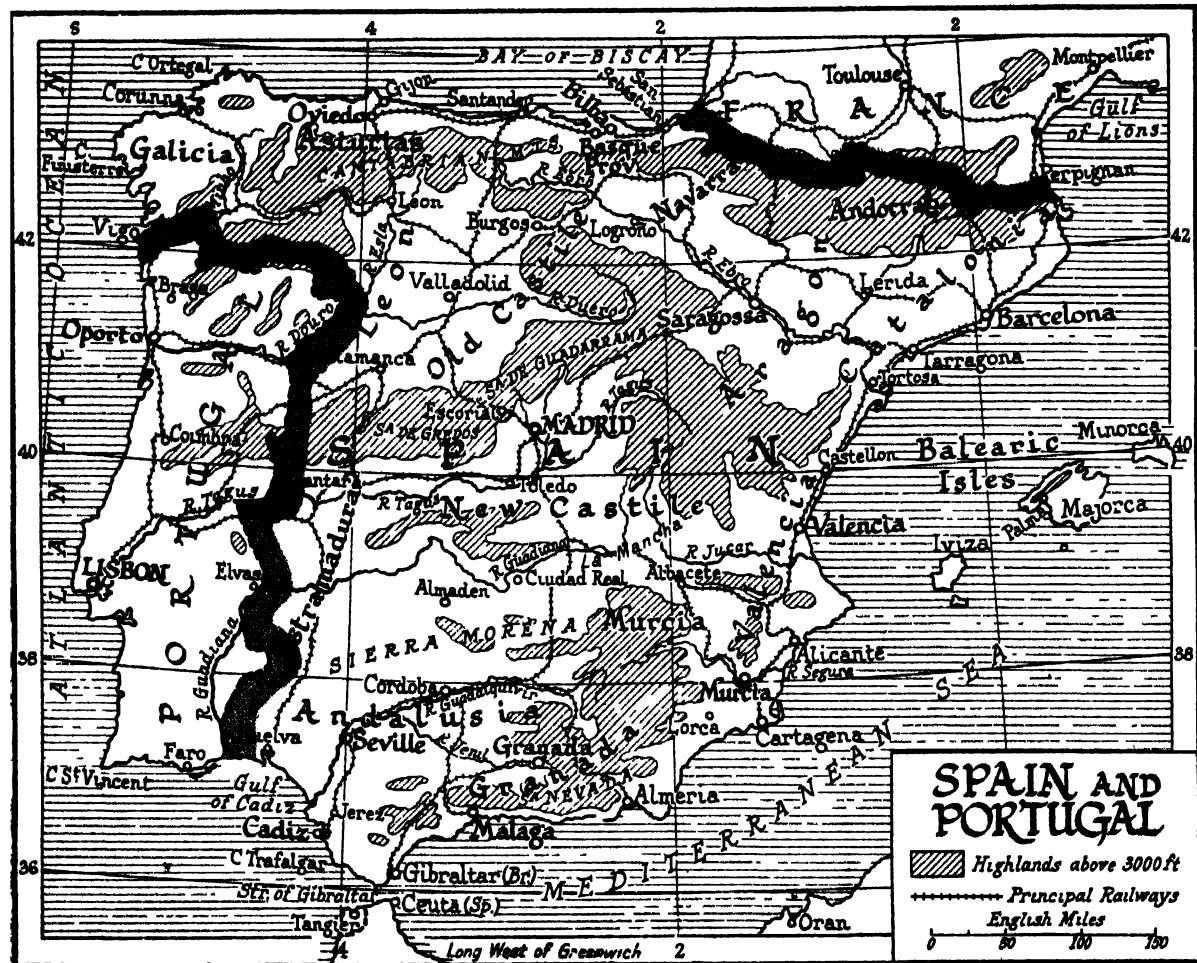
It is here perhaps worth mentioning that a greater degree of industrialization—which condition is very apparent in Italy to-day—does not mean that in the future there will be any contraction in her international trade, inasmuch as the needs of industries and the population expand in unsuspected directions. Moreover, when a race has to strive hard to adapt itself to geographical conditions, the efforts eventually result in the development of an imposing number of workers skilled in different occupations, and this proves a precious contribution to the wealth of a nation. Thus the difficulties encountered in the process of turning nature to good account may work for the good of the country as a whole.

FORMER COLONIES OF ITALY

In 1939 Italy's colonial possessions consisted of Italian Somaliland, Eritrea, Libya, and Abyssinia in Africa and of the Dodecanese Islands in the Aegean. After the war, however, Somaliland, Eritrea and Libya were placed under the control of the United Nations, Abyssinia was given back her independence and the Dodecanese were handed to Greece. In 1951 Libya acquired the status of a constitutional monarchy.

THE IBERIAN PENINSULA

(Including Spain, Portugal, Andorra, The Balearic Islands, Gibraltar and Malta.)



ALTERNATIVE PLACE NAME SPELLINGS

Douro = Duero (Spain), Iviza = Ibiza, Lisbon = Lisboa, Majorca = Mallorca, Minorca = Menorca, Oporto = Porto, Seville = Sevilla, Tagus = Tajo (Spain) and Feijo (Portugal)

Spain

SPAIN is a National State in the south west of Europe. It comprises eleven-thirteenths of the area of the Iberian peninsula, the remainder belonging to Portugal and Andorra. It is a self-contained country, bounded to the

north by the Pyrénées, to the east and west by the Mediterranean and Atlantic, and to the south by the Straits of Gibraltar. As an outpost of Europe and as a link with the outside world, Spain has always figured in European History.



MOUNTAIN SCENERY

A stone pack-horse bridge over the River Ara near Boucharo
in the Pyrénées

Photo: Sport and General

From 1936 to 1939 Civil War was waged. Because of the ensuing damage and economic difficulties agriculture and industry have since been hindered in their development.

Population and Area. The population of Spain in 1950 was estimated at 28,287,000—a steady increase of 2,400,000, since 1940.

From a geographical point of view its situation attracts the attention of the observer desirous of embracing at a single glance the map, not only of Europe, but of the globe. For the Iberian Peninsula stands foresquare to all the world: to Africa (of which it is so close a neighbour that the inhabitants of Tarifa and of Tangiers, looking from their windows across a strip of sea scarcely wider than the mouth of the Thames, behold the lands of the opposite continent); to America, in which connection it is interesting to note that, on one of the most vital routes between Europe and America, the towns of Vigo and New York are situated on approximately the same longitude; to western Europe, across the mighty range of the Pyrénées which separates it from France; and to eastern Europe, down the length of the Mediterranean Sea.

Five outstanding headlands form the apices of the pentagon which so clearly delineates the form of the Peninsula; beginning at the north-east and following the coastal outline, these are the Capes Creus, Gata, Punta Marroqui, San Vicente, and Finisterre.

The Iberian Peninsula has a total surface of 576,445 square kilometres, equivalent to 225,174 square miles. Of this 190,674 square miles belong to Spain, and the remainder to Portugal,

omitting the territory of the little Republic of Andorra, situated towards the north of the Province of Lerida, on the French frontier, and the Rock of Gibraltar and its territory.

To the land surface of Spain within the Peninsula there must be added that of the two island provinces, the Balearic and the Canary Islands, which represent 5015 square kilometres, or 1955 square miles, and 7272 square kilometres, or 2320 square miles, respectively.

Mountains. In general terms it may be said that the Iberian Peninsula is built up around the high central plateau, a region of continuous uniform geological formation which embraces the territories of Castile and Leon, extending towards Andalusia, the Levant, and the west of Portugal. Covering almost half of the actual Peninsula, it is a very ancient rock formation, composed principally of granites, Cambrian and Silurian slate, with Carboniferous deposits at the northerly and southerly borders.

The mountainous folds of the range end by forming the borders of the Peninsula, and at the end of the Tertiary period there were closed the two communications that had existed between the Atlantic and the Mediterranean (the Northern Andalusian Straits, formed by



THE COAST

The rugged cliffs, the sandy beach, and the village of Costa Brava
Courtesy of the Consul-General for Spain

the Valley of the Guadalquivir connecting at its higher point with that of the Mediterranean Rivers Jucar and Segura, and the South-Riffian Straits formed by the union of the valleys of the rivers of northern Morocco, Lucas and Sebu), and the crumbling of the borders of these two straits formed the present Straits of Gibraltar and delineated the actual contours of the Iberian Peninsula.

The borders of the mountain systems of the central plateau are these: on the north, the Montes Cantábricos which extend along the Cantabrian Sea throughout the Basque provinces, Santander, Asturias, and part of Galicia, being differently named in each of these provinces; [The highest altitudes of these mountains are: Naranjo de Bulnes, in the Picos (o Peñas) de Europa where the provinces of Asturias and Santander meet, 9800 feet (2800 metres); Peña Prieta, 7806 feet (2516 metres); and Peña Labra, 7007 feet (2002 metres)]. On the south, the Sierra Morena, a typically Spanish name, possibly given on account of the colour effect when the sun falls upon the mountain-tops in the upper part of the Valley of the Guadalquivir. There are no important peaks in this range.

The plateau is limited on the east by the Cordillera Iberica, a very irregular mountain formation which springs from the Cordillera Cantábrica, towards Peña Labra, and in a sinuous, and at times disconnected, line, takes a course from north to south, of great geographic importance, for it divides the Peninsula into two large regions which may be termed the Mediterranean Zone and the Atlantic Zone, with very different characteristics which appear even in the type of inhabitant. To the west of the plateau there is no mountainous border, and the three great Hispano-Portuguese rivers, the Douro, the Tajo, and the Guadiana, take their widening course through the valleys to empty themselves into the Atlantic Ocean.

Other than the mountainous borders already enumerated, which define the natural limits of that central plateau which is the geographical origin of the Peninsula, there exist two mountain chains of more modern formation, for which reason they include the highest altitudes found in Spanish territory. These mountain chains are: the Pyrénées, strictly speaking, in the north, and the Cordillera Penibética, or Sierra Nevada, in the south.

The range of the Pyrénées forms a mighty wall common to France and Spain, although some two-thirds of its length is Spanish. In

formation it corresponds to the folds of the Alps, and it extends from the mouth of the River Bidassoa, near San Sebastian, as far as the Cape of Creus, in Gerona, a distance of some 230 miles (400 kilometres). The highest point is the peak of Aneto, 11,914 feet (3404 metres) which is followed in importance by the peak of Posets, 11,784 feet (3367 metres) and the peak of the Tres Sorores, 11,728 feet (3351 metres). Although the Pyrénées have a constitution which may be considered as altogether independent from the rest of the orography of Spain, the Cordillera Penibética is so linked to the farthermost fringes of the Cordillera Iberica that it might be considered as the termination towards the south of that important system.

The heights of the Cordillera Penibética culminate in the Sierra Nevada, where the highest peaks in the Peninsula are to be found: El Mulhacén, 12,183 feet (3481 metres), La Veleta, 12,145 feet (3470 metres), La Alcazaba, 11,821 feet (3386 metres), El Tajo de los Machos, 10,920 feet (3120 metres), and the Pico del Cuervo, 10,850 feet (3100 metres).

Rivers. The general contours of the mountain formations of the Iberian Peninsula determine the characteristics of the water systems, and in this sense the Iberian range exercises a very great influence, for from amongst its spurs rise the most important Spanish rivers, to find their way either towards the Atlantic or the Mediterranean.

The most important river, both for length and the extent of its basin, is the Tajo (Tagus), rising in the Cerro de San Felipe in the Nudo de Albarracín: its length is 626 miles (1001 kilometres) and it crosses the Peninsula in a westerly direction, to empty itself into the Atlantic Ocean, near Lisboa (Lisbon). The next in order is the Duero (Douro), 582 miles in length (937 kilometres) which flows from the watersheds of the Picos de Urbion, bathes the northern part of the central plateau in the regions of Castile and Leon, and empties into the Atlantic, in Portugal, close to Porto.

The third longest Spanish river is the Ebro, which, unlike those previously mentioned, is entirely Spanish. It rises in Fontibre, not far from Reinosa, in the province of Santander, and in its middle and lower zones irrigates an important agricultural area which, beginning in La Rioja in the province of Logroño, continues into La Ribera in the provinces of Alava and Navarra, and so into Aragon and the southern regions of Cataluña, to find its way



SCENES OF SPANISH LIFE

1. River transport. 2. Road transport. 3. Earthenware jars used for water storage near Cordoba. 4. A cattle round-up. 5. Girls of Andalusia in national costume. 6. A village pound. 7. Peasants of Catalonia collecting fallen olives. 8. A Spanish wedding. 9. A farmhouse of Lamona

Photos: Keystone; Planet; Wide World

into the Mediterranean, very near to Tortosa. The Ebro is 575 miles (920 kilometres) in length.

The River Guadiana, 497 miles (801 kilometres) in length, is characterized by the fact that, at a certain distance from its source, on crossing the *manchega* region, near to Argamasilla de Alba, it filtrates and disappears, and it is supposed that it returns to the surface in the place called Ojos de Guadiana. This phenomenon of filtration is relatively frequent in the manchegan territory, as a consequence of the composition of the soil. The most general recent opinion is that the River Guadiana is formed of the union of the Rivers Záncara and Cigüela, which rise in the Serranía de Cuenca, although it was for long supposed that the source of this river was in the lakes of Ruidera. During one section of its length it forms the frontier between Spain and Portugal, and it enters the Atlantic Ocean, marking the division between Spain and Portugal, at Villa Real de San Antonio and Ayamonte, villages situated opposite each other in the two countries.

The Guadalquivir has a length of 422 miles (680 kilometres); it rises in the Sierra de Cazorla and passes through Cordoba and Sevilla to empty itself in the Atlantic, near Sanlucar de Barrameda, in the province of Cadiz. It is the only Spanish river which allows of navigation by vessels of deep draught, and in consequence of this, Sevilla, some eighty miles from the mouth, is enabled to be a port of great commercial importance.

There is also the Júcar, some 309 miles in length (498 kilometres) which rises in a very important watershed, the Nudo de Albarracín, and empties in the Mediterranean near Cullera, in the province of Valencia; and the Segura, which rises in the same mountainous region, so important from the point of view of river formation, and, after covering 174 miles (341 kilometres) empties into the Mediterranean in Guardamar, Murcia.

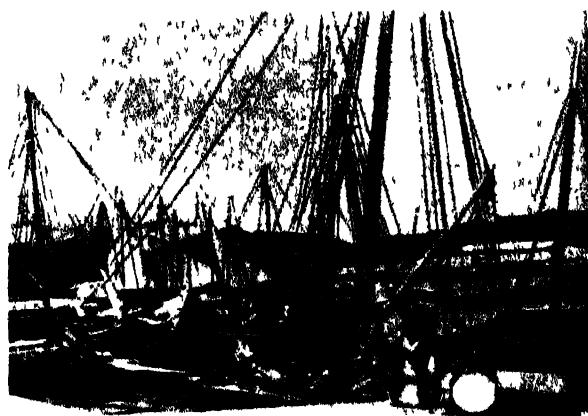
The most important river in the north is the Miño (Minho), 173 miles in length (340 kilometres) which rises in the tableland of Lugo, formed by the union of several tributaries, and has its mouth between Laguardia (Spain), and Caminha (Portugal), after serving as the border of the two countries in the latter part of its course.

Monetary System. The basis of the Spanish monetary system is in accordance with the Treaty of the Latin Union of the year 1865. The monetary unit is the peseta, which is divided into one hundred céntimos.

The Bank of Spain is privileged to issue paper money, and although in theory the regime for the issue of bills in Spain corresponds to that of countries where issue is free, subject to certain guarantees which the State requires of the banks, actually it cannot be issued other than by the Bank of Spain, which has a contract with the State, renewable upon expiry. For this concession it has to perform many services for the State, free of charge.

Industry. In spite of the modern technique of statistics, which daily offers greater reliability in the collecting and classification of data, it is an impossible feat to express in one figure the total wealth of a country. However exact the statistics may be, there are always certain sources of wealth of which the value cannot be determined except by means of approximate calculations, usually aided by the imagination.

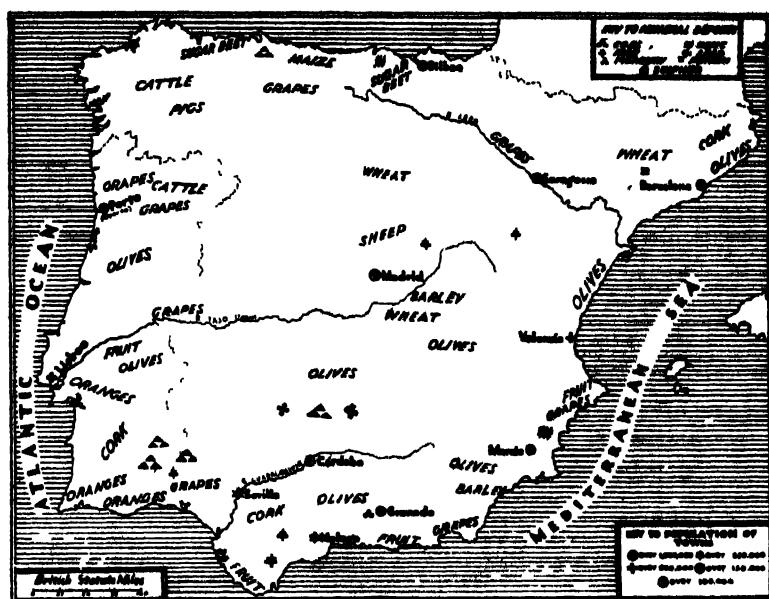
The principal sources of riches in Spain, in order of importance, have been listed as: Rural wealth, urban property, mineral wealth,



INDUSTRY

Above: Fishing boats in Vigo Harbour. Below: The Rio Tinto mines at Huelva

Photos: Keystone



industrial wealth, gold. Of all the Spanish industries agricultural wealth occupies a preferential place, especially on account of two main products which carry the name of Spain throughout the world—olive oil, and wine. In addition to these, however, the climate is conducive to the cultivation of such heat-loving fruits as dates, almonds, pomegranates, and lemons, as well as the universally famous orange crop.

Olive Oil. Almost the whole of Spanish territory is suitable for olive cultivation and, therefore, for the production of oil, but certain regions are outstanding in this sense.

If we drew an imaginary line starting from the extreme north-east of the Peninsula, in the province of Gerona, across to the farther south-west, in the province of Huelva, Spain would be divided into two sections; one, which we may call the lower, which comes south of this imaginary line, is the oil-producing region *par excellence*, for there lie within it the two richest olive zones in Spain, comprising, the first, the provinces of Jaén, Córdoba, Sevilla (Andalusia), and Toledo in New Castile, and, the second, Zaragoza (Saragossa), Teruel, Aragon, and Tarragona (Cataluña).

Wine. Wine is produced almost throughout the whole of Spain. In 1950 the registered production of wine in all Spanish provinces was 14,324,000 hecto-litres, which was only about half the figure for 1920 however.

Nevertheless, the industrial exploitation of the various qualities of Spanish wines concentrates more on certain regions, from whence

come the wines of world fame. Thus, in Andalusia, cradle of the famous Jerez wines, there is cultivated a special kind of grape suitable for the wine of this name, especially in Cadiz, wherein lies the district of Jerez.

Another of the important wine-producing regions is La Rioja, which lies in the province of Logroño, and partly in Alava and Navarra, in the southernmost regions, where the Ebro flows. The wines produced in these regions are not so characteristic as those of Jerez, but, as a consequence of determined efforts towards improvement, there have been produced certain qualities in selected table wines, white and red, which vie

with those of Bordeaux and Burgundy in France.

The levantine region, Murcia, Valencia, and Cataluña, is very productive of wines which, if of somewhat lesser repute than those above mentioned, are much used for home consumption, and also for shipment to France for the "Coupage" of the French wines.

The region of La Mancha, covering the provinces of Ciudad Real, Toledo, and Albacete, is very productive, and the grades of wine here produced may be considered as amongst the most genuinely Spanish of table wines.

Other Industries. Apart from its vine and olive growing capabilities, the country is generally fertile. Its chief crops are wheat, barley, maize, oats, rice, hemp and flax. The growing of oranges, too, has always been important—Seville oranges are world famous—and this industry is being encouraged by the government. After the Civil War, production fell to about half the normal figure.

Second in importance to agriculture is the mining industry, for the country is rich in iron, copper and lead ores, although these have not been fully exploited. Production of steel in 1950 was 818,000 tons, of pig iron 671,000 tons, and of copper ore 252,000 tons. Mercury and wolfram (the ore from which tungsten is extracted) have become increasingly important, though the figures of production seem small by comparison—approximately 34,000 tons (1950) for mercury and slightly under 800 tons (1950) for wolfram.

Coal is also important and its production has

been stepped up by the Government so that imports can be reduced. Production in 1939 was 6,612,000 tons, and in 1950 it was 9,613,600 tons. A quantity of lignite is also mined (1,315,700 tons in 1950).

The textile industry is well established and is centred on Cataluña. The silk industry flourished in the earlier part of the century but has declined since 1929 due to the rivalry of artificial silk.

Sardine, tunny and cod fishing have given rise to a large canning industry, comprising over 1,200 factories.

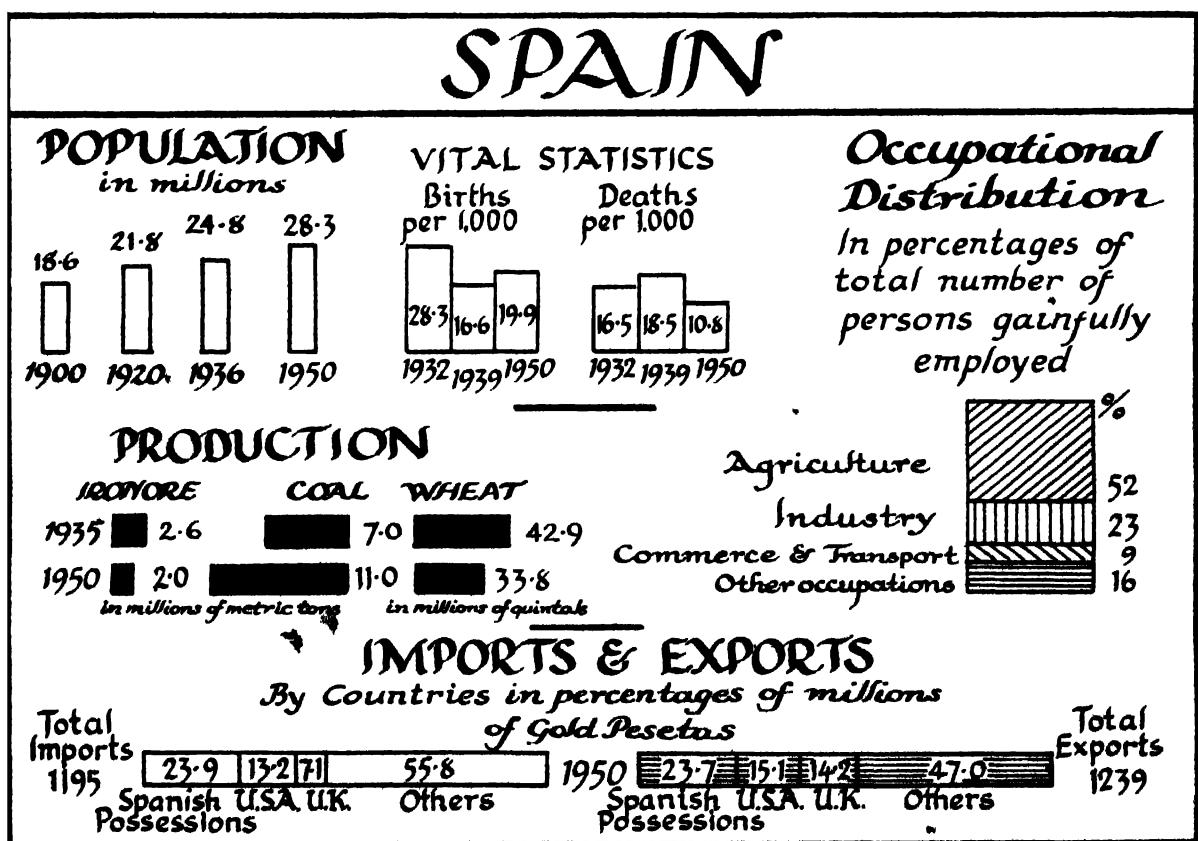
Commerce. Spain, by reason of her geographical situation, has always been on the crossroads of the commercial routes between Europe and the rest of the world. Prior to the discovery of America, the privileged position of the Levant coast favoured the rise of the towns of Valencia, and, especially, Barcelona. The discovery of the route to India via the Cape of Good Hope, and the discovery of America, opened new horizons to commerce, and Barcelona lost importance at the same time that Sevilla gained it.

But Spain may yet again become a cross-roads of commercial routes. Modern air routes

are centred on Western Europe and Spain is already taking advantage of her position. Many routes now cross her borders and her own air lines are spreading out.

The balance of commerce was interrupted both by the Civil War and by the second World War. Before that, Spain and Great Britain benefited by mutual trade. Since then, however, Spain has adopted a programme of self-sufficiency, whereby she is trying to cut down her imports by raising her own production and exports. In 1940, England was Spain's biggest customer but by 1941 this title had gone to Germany. In that year, Argentina was the biggest furnisher of imports and Germany the second largest. The loss of the German market was thus a blow to Spain, but in 1946 she made trade agreements with Argentina and Switzerland. In 1948 special exchange rates were established to facilitate Spanish exports to the sterling and dollar countries.

Roads. The first roads in Spain worthy of the name were undertaken in the reign of Fernando VI. Under the Government of the Marques de la Ensenada there was entrusted to a Spaniard of English origin, Bernardo Ward,





HISTORIC SCENES

1. The bridge of Toledo showing the Alcazar 2. An old street in a village of Coruna, Santiago de Compostela, famous for its cathedral in which rest, according to tradition, the bones of St James the Apostle 3. The Alhambra, Granada, for many centuries the seat of Moorish power

Photos Keystone Central

the mission of making a journey through the most civilized nations of Europe to study the development of industry in general, and, as a consequence of this journey, he proposed the construction of six roads, radiating from Madrid to the farthest points of the Peninsula, which suggestion, a century later, served as the basis for the drawing up of a general plan for the railway. Almost a century elapsed before the conclusion of the construction of the six roads proposed by Ward, which, to-day, constitute the principal axles of the system of highways and thoroughfares in Spain. They are as follows: 1. Madrid to La Coruña via the port of Guadarrama, length 633 kilometres or 393 miles; 2. Madrid to France via the port of Somosierra, San Sebastian and Behobia, length 478 kilometres or 297 miles; 3. Madrid to France via Barcelona and La Junquera, length 768 kilometres or 477 miles; 4. Madrid to Sevilla and Cadiz, length 673 kilometres or 418 miles; 5. Madrid to Valencia, length 390 kilometres or 205 miles; 6. Madrid to Badajoz,

to continue to Portugal, length 400 kilometres or 248 miles.

The roads in Spain are of three classes, according to the entity which supplies the funds: State roads, which both as regards construction and upkeep are paid for out of the general funds of the national budget; provincial roads, which fall to the care of the provinces (counties); and Caminos Vecinales, means of communication of minor importance which are constructed by the municipalities (boroughs) separately, some of them connecting up with others amongst themselves. In 1950 there were 69,050 miles of highways and roads.

In about 1924, the Government made the decision to improve the condition of the roads, in view of the great increase in automobile traffic, both passenger and freight, and for this purpose there was formed the Circuito Nacional de Firmes Especiales. This department studied the condition of the roads in detail, and commenced the fundamental trans-

formation of the principal highways, improving them in all senses, and, as a consequence of their work, there are to-day in Spain many miles of roads of modern type, with good surfaces which allow of travel over great distances in perfect comfort. There are under consideration certain motorways which will complete the programme of the Circuito Nacional de Firmes Especiales.

Railways. Spain occupies the ninth place amongst European countries in order of the establishment of railways. The physical structure of the Peninsula, with its mountain ranges lying along the parallels, constitutes a serious obstacle to this means of communication. On the other hand, from the fact that Madrid, the capital, lies so absolutely central, there arose the position that the first plan for the railways, made in 1850, considered Madrid as the origin and point of convergence for all railway communications. Consequently all the principal railway lines in Spain start from Madrid. These lines are: Madrid-Coruña, 831 kilometres (516 miles); Madrid-French frontier, Irún-Hendaye, 634 kilometres (393 miles); Madrid-French frontier, via Barcelona, Port-Bou, Cerbere, 855 kilometres (531 miles); Madrid-Alicante, 455 kilometres (282 miles); Madrid-Sevilla, Cadiz, 727 kilometres (451 miles);

Madrid-Portuguese frontier, via Badajoz-Elvas, 528 kilometres (328 miles); Madrid-Portuguese frontier, via Valencia de Alcántara-Marvao, 480 kilometres (298 miles).

All of these lines, within one hundred miles of their commencement, encounter natural obstacles of considerable importance in the mountain chains that lie outstretched across the Peninsula opposing the normal direction of the railway lines. The only exception is the Madrid-Alicante line, which, apart from the difference in altitude between the two capitals of 2380 feet (altitude of Madrid) and 0 feet at Alicante, descends gradually throughout its length. (Altitudes in Spain are estimated taking as the basis of measurement 0 feet at the Mediterranean sea-level at Alicante.)

For political reasons, based on considerations of defence against possible invasion by foreign armies, from the beginning the gauge of the Spanish railways was fixed at a somewhat greater width than the normal European gauge, being 5 ft. 5 in. (1.674 metres). Portugal also uses this gauge. This fact creates the position that the Spanish railway system is completely disconnected from that of the rest of Europe, which causes great economic loss to Spain. Subsidiary lines, covering short



CORUNA

The promenade, business centre, and the harbour

Photo. Blue Star Line



SAN SEBASTIAN

A view showing the natural harbour, the bull ring, and the position of the town sheltered by the mountains of northern Spain

Photo. Topical

distances, connect the centres of agricultural, industrial, or mining activities with the larger towns nearby, and with the ports. These have a gauge of one metre (3 ft. 3 in.) and are established principally in Catalonia, the Basque country, Asturias, and the Levant region.

Hydro-electric Power. The difficulties which the geographical structure of the territory offers to communications of all kinds are, in part, compensated by the inextinguishable fount of energy which is derived precisely from the inequalities of the land produced by the complicated mountain systems. The hydro-electric energy, the "white coal," one of the determining factors for the future economy of the towns, exists potentially in great quantities in Spain. At present, 90 per cent of Spain's electrical force comes from the water and from the inequalities of the territory, factors which recompense the national economy in this form for the great losses otherwise occasioned. Taking advantage of this wealth of electrical energy, the electrification of the Spanish railways is going forward with considerable rapidity.

The first "underground" in Spain was established in Madrid, in 1919. To-day there are five lines, some thirty miles in length. In Barcelona the first underground line was opened to the public in 1927, and there are

now two, shorter and less busy than those of Madrid.

The railway system of Spain was nationalized in 1941. It comprises (1950) about 12,950 miles of line, of which 937 are electrified.

Ports. In spite of the fact that the five sides of the pentagon which forms the outline of the Iberian Peninsula are washed by the sea, the coastline is in general continuous, with but an occasional opening, so that natural ports are scarce. Also the river mouths offer no convenient entry, but rather produce bars which present difficulties to navigation. Consequently, Spanish ports worthy of the name are few, and are sometimes of completely artificial construction. The principal ports are: Barcelona, Valencia, Sevilla, Cadiz, Vigo, Santander, and Bilbao. The naval ports are: Cartagena, San Fernando (Cadiz) and Ferrol.

In 1921 the Spanish Merchant Marine occupied the eighth place amongst the merchant marines of the world, having 1210 vessels with a total tonnage of 1,005,133. In 1942 it comprised only 1000 vessels of 1,056,800 tons. This was nearly down to the 1921 level and was the lowest tonnage since that date, losses being suffered in the Civil and World Wars. The 1950 figures are 1,400 vessels of 1,206,000 tons.

The Spanish coasts are difficult for navigation, especially in certain regions, such as the Cantabrian coast, and north-west Galicia, both on account of the force of the currents, and the structure of the coast, full of shallows and reefs, especially at the river-mouths in Galicia.

Rural Life. The conditions imposed by geography on agriculture in Spain are hard,

Where these great estates predominate, that is in the provinces of Ciudad Real, Toledo, Albacete and Salamanca, the agricultural crisis has been at its worst and the hardships of the peasantry most pronounced.

The word "feudal" is a good point of departure for any account of the life of rural Spain, where the shadow of the past lies across so much, and where tradition rules the countryside. No greater contrast could be found, for example, than that which exists between the Spanish and the English village. In Spain the village has no main street, no village green. The Englishman's home is proverbially his castle, but is, in the country, more likely to be a cottage. The Spaniard's home, though he would not think of describing it as a castle, resembles a fortress built with an eye to defence, rather than a home to be lived in.

Heavily built stone houses, centuries old, line the narrow streets that turn and twist around a flagged square that occupies the centre of the village. The doors are of thick oak and studded with nails. Solid iron bars cover the deep-set windows as with a grille. As we go down the narrow passages between the houses, we can see through open doors gloomy shops, the goods for sale hidden rather than displayed. It is the village shopkeeper's purpose, with the tax-collector in mind, to look as poor as possible, not as prosperous. The central square, surrounded perhaps by a stone arcade, and with benches and tables outside its two or three cafes, is the focus of village life. Here the young men parade in the evening and here the grave questions of the day, such as the supply of water for the fields, are discussed by the villagers.

The need for water and the shortage of supplies are serious problems for the Spaniard. Water is to-day, and has always been, a difficulty for the Mediterranean agriculturist. In the writings of Plato we can find references to the "old and good laws concerning water for the fields"; and such traditional courts as the "Water Tribunal" that sits at Valencia bear witness to the permanence of the problem and to the Spanish adherence to old-time ways of solving it. Often, in Spain, two villages will share the same water supply. A brook or rivulet will be diverted near its source in such a way that, on Mondays, Wednesdays and Fridays, it will run down through the fields and streets of one village, and on the other days of the week will irrigate the land and supply water to another.



VALENCIA

Above The Market Below The Cathedral
Photos Blue Star Line

and the life of the Spanish peasant is even harder. Before the Civil War started the rural population numbered some 9000 great landed proprietors and some 9700 owners of medium-sized estates; while in contrast to this there were about 160,000 small peasants just able to gain a precarious living from the soil, and 845,000 poorer peasants, not absolutely landless, but forced to eke out an existence by hiring themselves to other and more prosperous land-owners at daily wages. The problem of Spanish agriculture has always been the double one of "internal colonization" through the settling of more small proprietors on the land, and the breaking up of the feudal estates.

Spain is a land of great contrasts, and different forms of agriculture are responsible for certain differences appearing in the way of life of the people in the various provinces. One type of rural life predominates in Andalusia, the country *par excellence* of the olive field; another in the wheat-growing districts of Badajoz, Toledo, Cuenca, Valladolid and Burgos; and a third in the cattle provinces of the Atlantic seaboard. Differences can even be great in the same locality: flowered Aranjuez, the Guadarrama Range, snow-covered even in

rivers or from low-lying channels to ditches lying at higher levels abound in Spain, and are for the most part replicas of those once used (and still used) in ancient Egypt. Everywhere one sees the tall poles, with their swinging cross bars, to one end of which a clay weight is attached while a wooden bucket hangs from the other. Ploughing methods, while equally primitive, are not so effective. The wooden plough-share in common use barely scratches an inch or two of the top-soil.

With all these difficulties, in spite of pains-



MADRID BEFORE AND DURING THE CIVIL WAR

1. The Calle de Alcalá with the Bank buildings and the Alcázar Theatre photographed before the Civil War. 2. A war scene in Madrid, with shoppers making purchases from pavement vendors owing to the damage done to shop property. 3. A main street after bombing operations

Photos Keystone

June, and the treeless wastes of La Mancha, are none of them much more than thirty miles from Madrid.

But the visitor to Spain, while noting these local variations, will be impressed by one feature which seems to be characteristic of agricultural life all over the country, and that is the persistence, in spite of industrial revolutions and modern inventions, of an age-old, even Biblical, agricultural technique. From the window of his railway carriage, as he passes over the central Spanish plateau, the traveller can watch "the patient oxen treading out the corn." In the fields in summer the golden pyramids of grain shine in the sun, and peasants in their blue cotton overalls, their almost black faces shaded by wide-brimmed straw hats, stand tossing the corn up into the air for the wind to blow away and separate the chaff. Irrigation devices for lifting water from the

taking and back-breaking work that yields but small results, the Spanish countryside has a virility, a colour and a joyfulness that cannot be suppressed. The Catalonian *sardana*, the Valencian *jota* and the *urrescu* of Navarre and Murcia and other local dances bear witness to the spirit of the Spanish people. The climate moreover favours open-air spectacles, and every part of Spain has its local festivals. No countryside where the music of the guitar, of the tambourine and of the castanets is so often heard can be devoid of hope for the future.

Cities and Towns. Few countries in Europe are richer in picturesque and historic cities than Spain. Madrid, the capital, is so centrally situated in the Peninsula that a small hill on the outskirts, El Cerro de los Angeles, marks the exact centre. Although the capital, Madrid has not the rank of city, but of *vila*, which is not so high a classification. In Spain,



CADIZ
The street market
Photo Blue Star Line

the urban groupings may be classified as *ciudades*, *villas* or *pueblos* (cities or towns) and the small, non-urban concentrations of houses in the country are classed as *aldeas* (villages or hamlets).

Madrid is a relatively modern town, especially as regards the outlying districts. Its importance is administrative rather than commercial or industrial. It is characterized by the kindness and keen-wittedness of its inhabitants, even though the larger part of these are not pure Madrileños. The population in 1950, was 1,609,500.

The next largest city, with a population of 1,280,200, is Barcelona. It is the capital of Catalonia, and the most important commercial and industrial centre in Spain, possessing an immense harbour. The modern expansion of the city has been northward and the new portion has been laid out on strictly regular lines, with fine thoroughfares, notably the Gran Via and the Calle de las Cortes. The old town on the south has narrower streets, but they are less irregular than those of other Spanish towns.

South of Barcelona, on the Mediterranean coastline, is Tarragona, standing picturesquely on a hill that commands delightful views. The old town, with quaint and narrow streets, is surrounded on three sides by old Roman walls about twenty feet thick.

Castellon de la Plana, farther south, is a bright, modern town, with good buildings, and doing a thriving trade in oranges.

Valencia, the third city in population, lies

on the Guadalquivir, three miles from the Mediterranean. As a town it is a blending of the ancient and modern, the old Moorish walls having given place to broad boulevards. Its Gothic cathedral has two distinguished portals. Two bell-towers are well-known landmarks: one is the tall hexagonal bell-tower of Santa Catalina, regarded as one of the most graceful in Europe, and the other is the octagonal Mignelette of Moorish origin.

Alicante is of some commercial importance, but is also a winter resort that is growing in popularity.

Malaga is another port situated on the south coast. The town itself is practically modern, the only ancient building being the Gibralfaro, a Moorish castle.

Algericas, possessing rather ugly quayside buildings, but a bright and clean interior, is also a popular winter resort on the Mediterranean coast.

Tarifa, the most southerly point of Spain, is noted for its Moorish Alcazar and turreted walls.

Cadiz is Spain's most important port on its south-westerly coast. It is almost completely surrounded by the sea, and in many ways is an ideal harbour. Its handsome houses are nearly all provided with *miradores*, or glazed balconies, and are built very high because lateral extension is impossible. For the same reason the streets are very narrow, though straight.

Sevilla, a winter resort, is on the River Guadalquivir, in the midst of a country of vineyards, orange and olive groves. It is a



A SPANISH COURTYARD HOUSE
A domestic scene in a home of Sevilla
Photo: Keystone



MONTSERRAT

Courtesy of the Consul General for Spain



COUNTRY TYPES

1. Carrying oranges from plantation to homestead in the Alciva region. 2. A gipsy. 3. Peasant woman with her donkey.
4. National costume showing the mantilla. 5. Harvesting.

Photos Planet, Keystone, Photopress

flourishing city with a Gothic cathedral that is unique.

Granada, another town of southern Spain, is an old Moorish city, famous for its Alhambra Palace, distinguishing features of which are its arcaded courts, delicate marble columns and domed ceilings.

Cordoba, situated on the banks of the Guadalquivir, was a Moorish city of importance. As with most towns in southern Spain, its general aspect is one of extreme cleanliness and brightness. A fine Roman-Moorish bridge of sixteen arches with buttresses leads across the river to the foot of the town.

Toledo, south of Madrid, was noted before the civil war for its Alcazar, an imposing citadel, that was used as a military school. It stood on a plateau, at the highest point of the granite hill on which Toledo is built. The cathedral of Toledo was reputed to be one of the most magnificent in Europe.

Avila, west of Madrid, is a quaint and highly interesting old fortified town, completely surrounded by an eleventh century wall, which includes eighty-eight semi-circular towers and eight gates of entrance. It stands on the top of a hill, 3713 feet in height. The cathedral is built with fortress-like severity.

Salamanca, also in western Spain, stands on three small hills, at a height of 2648 feet. It is chiefly famous for its university, which so far back as the fourteenth century, ranked with those of Oxford, Paris and Bolonga. It has a very fine library and a remarkable staircase, the bas-reliefs of which depict knights on horse-

back engaged in a bull-fight. The Plaza Mayor is a fine square, its arcade having eighty-eight arches, and it includes a handsome Town Hall. The city has two cathedrals side by side: the Veija is an exceptionally striking Romanesque building dating from the twelfth century; the Nueva was begun in the sixteenth century and finished in the eighteenth.

In the north-west is Santiago, famous for its cathedral and forty-five churches, and the harbour of Vigo, world-famous for its depth and safe anchorage. Oviedo is a large town of good appearance, with a fine Gothic cathedral. Gijon, on the coast, is finely situated and has a spacious harbour on one side of the Catalina headland. Burgos, another northern town, is noted for its Gothic cathedral.

Santander, on the coast, is primarily a seaport, but has grown in favour as a holiday resort. It has a fine harbour, and is a popular yachting centre. Bilbao is a large and busy port. The main town in north-east Spain is Saragossa, a prosperous commercial centre.

COLONIAL POSSESSIONS OF SPAIN

Spain's colonial possessions, apart from the Balearic Islands (see page 279) and the Canary Islands (see Africa: Islands of the Atlantic), which are reckoned as Spanish provinces, are Spanish Morocco, in the north of Africa, Rio de Oro and Ifni, in the north-west, and Spanish Guinea (Fernando Po). References to these areas will be found under Africa; Intertropical Africa. Their combined area is 134,715 square miles and their population 2,830,000 (1950).

Andorra

ANDORRA, one of the world's oldest republics, perched high on the eastern slopes of the Pyrénées, is marked by a wild, dramatic beauty and solitude. Its area, 175 square miles, is mountainous, some peaks rising to about 9000 feet, while the valleys are traversed by swiftly flowing streams, the chief of which is the Valira. For eight months of the year, the Emballira pass, communicating with France, is closed by heavy snow, and everywhere the mountain passes are difficult. The country is rich in iron, lead and granite.

The Andorrans, numbering about 5500, are a hard-working people who are engaged in a continuous struggle to extract a subsistence from the soil. Every inch of the available ground is cultivated and in most of the rock-girt fields are grown tobacco, cereals, vines or fruit. The lower levels provide excellent pastures for sheep and cattle.

Andorrans are good Roman Catholics, speak the language of Catalan, and use Spanish

coinage. Their spiritual inclination is towards Spain and there still exists an age-old custom whereby each Christmas the Councillors-General call on the Bishop of Urgel and present him with a tribute of twelve chickens, six hams and six cheeses.

The people resent interference from the French Government and boast that their independence dates from 1278 when a long-standing dispute between the Counts of Foix and the Bishops of Urgel, Spain, was settled by an agreement that Andorra should be independent but under the suzerainty of the Counts and the Bishops. That agreement still prevails, the Presidents of the French Republic being heirs to the rights of the Counts of Foix.

Andorra remained in a state of feudalism until 1929 when new roads were built in return for a concession to develop its water power, the company obtaining the concession being 60 per cent French and 40 per cent Spanish.

When civil war broke out in Spain in 1936,



GENERAL VIEW OF ANDORRA
Photo: Fox

the French sent to Andorra a force of 300 Gardes Mobiles and the Spanish authorities closed their frontier to everything excepting mail vans. This created a serious situation, for the Andorrans were dependent on Spain for food. Prior to this, Andorra had been a comparatively prosperous community, for both France and Spain granted it special trading facilities.

Andorra Va Vieja, the capital, is 4510 feet above sea-level. It has narrow, crooked cobbled streets, with houses built at all angles. The population is less than 200. Encamp is the village where the President of Andorra lives and works. Sant Juan, the largest village in the state, is about twice the size of the capital.

*Balea*tic Islands**

THE Balearic Islands are a group of fifteen in the Mediterranean, forming a province of Spain. The chief are Mallorca (Majorca), Menorca (Minorca), Ibiza (Iviza), Formentera and Cabrera. The combined area of all the islands is 1955 square miles. Population totals 429,000. The coasts are rugged and dangerous, but Mahon, the capital of Menorca, is one of the best ports in the Mediterranean.

Mallorca is the largest island of the group, with an area of 430 square miles. It is well wooded and very well cultivated. It possesses a number of marble quarries and a small quantity of coal. Menorca has valuable deposits of iron, copper, lead and marble. It

is less fertile than Mallorca, being drier. Ibiza has a well-wooded, hilly surface, but its valleys are fertile. Vines, olives, figs, almonds and fruits are cultivated. On the larger islands sheep are numerous, but the wool is not of good quality. The fisheries are very valuable. Timber is exported from Ibiza.

Superphosphates, cement and coke are manufactured, and on Mallorca shoes and cloth are made.

The principal towns of Mallorca are Palma, Felanit and Manacor. Palma, the capital of the group, is a prosperous seaport. Ibiza, capital of the island of the same name, also has a fine harbour.

Gibraltar and Malta

GIBRALTAR is a British fortress and naval base near the southernmost point of Spain, guarding the western entrance to the Mediterranean Sea. Practically the whole of it is the mountainous promontory known as the Rock. It is connected with the mainland by a long, sandy isthmus three-quarters of a mile long, and averaging about ten feet above sea-level. The Rock itself consists, in the main, of brownish grey limestone, containing numerous caves. The area is nearly two square miles. Europa Point is its southern extremity. The Rock rises abruptly to 1439 feet above sea-level on all sides excepting the west.

Gibraltar has a good harbour, protected by two moles. The only industries are ship-repairing and cigarette manufacture.

There is, of course, a strong British colony, chiefly connected with the army and naval forces, numbering 3500. Most of the other inhabitants totalling 19,800 are of Italian or Genoese descent.

MALTA, an island in the Mediterranean Sea, belongs to Great Britain and ranks as one of the world's chief naval stations. The colony consists of Malta itself, the islands of Gozo and Comino, and the uninhabited rocks of Cominottis and Filfla. Malta is known as the "George Cross Island," having been granted this honorary decoration in recognition of its heroic stand during the last war.

The civil population, numbering 307,000 is mostly engaged in agriculture, the islands having more than 10,000 farms. The presence of phosphates makes the soil remarkably fertile. Almost the entire surface of the island is intensely cultivated, the chief crops being grain, potatoes, oranges, olives, and figs.

Valetta is the capital and chief port of call. South-west, on the other side of the Grand Harbour, are the cities of Senglea, Vittoriosa, and Cospicua. At the old capital, Notabile, are the catacombs and ancient cathedral. Near Valetta is the modern town of Slienna.

Portugal

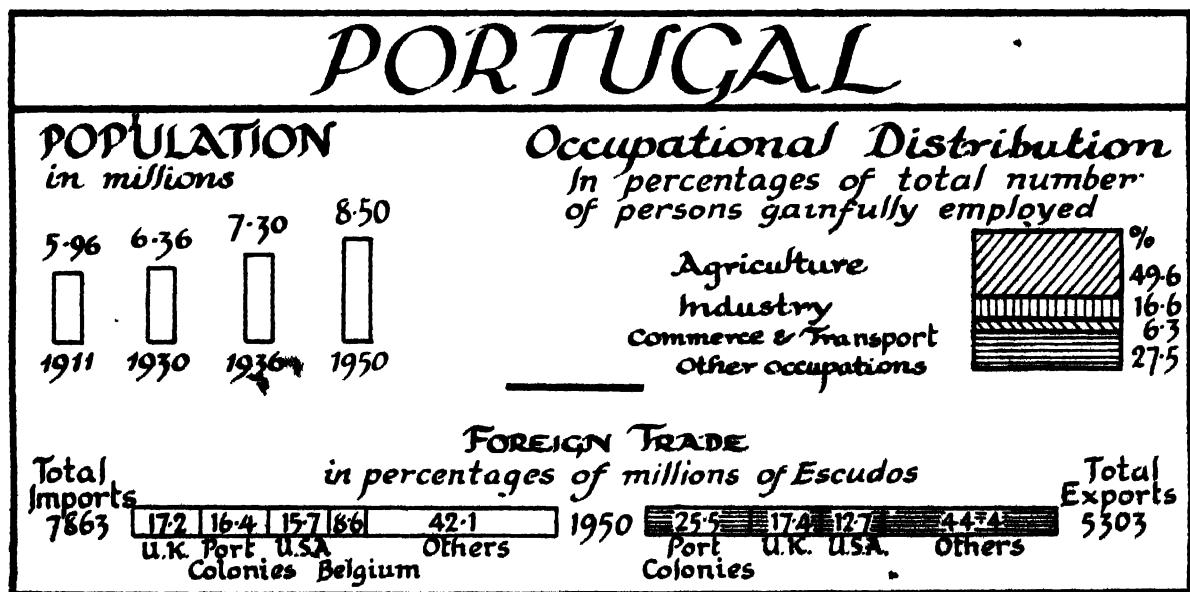
THE wise visitor to Portugal makes his approach to the capital by sea. Few sights are more memorable than that of Lisboa (Lisbon), first seen from the Tagus, with its whitewashed houses and marble palaces, terraced on a series of steep, low-lying hills, gleaming under the pale blue sky of a spring morning or suffused with the peculiar, pinkish half-light of an autumn sunset. Any one of its "seven" hills affords magnificent views over the city and the great inland harbour, which rivals the Bay of Napoli in beauty and can provide anchorage for all the navies of the world.

Lisboa derives its name from *Olysipo*, under the influence of the mythical story that it was founded by Odysseus (Ulysses), but its Portuguese history dates from 1147, when, with English aid, it was captured from the Moors. The Castle of St. George, formerly the Moorish citadel, dominates the east end of the city (*Alfama*), and overlooks the Romanesque Cathedral, which was built in 1150 by D. Afonso Henriques, first king of Portugal, and is of considerable antiquarian interest, despite damage by earthquakes, fires and injudicious rebuilding. The lower part of the city (*Baixa*) was laid out by the Marquis de Pombal, after the great earthquake of 1755, and is the first example in Europe of modern town planning. From the spacious Praça do Comércio ("Black

Horse Square"), surrounded on three sides by arcaded buildings housing government offices and open to the river on the fourth, long, straight streets, each originally allocated to a craft or trade (Street of the Goldsmiths, Silversmiths, Gilders, Saddlers, Tailors, Drapers, etc.) lead to the Rocío, the square of tessellated pavements, which is the hub of Lisboa's social life. The fourteenth-century Gothic Church (*Convento do Carmo*), which overhangs the Rocío, now contains an archaeological museum, but its ruined shell is a perpetual testimony of the terrible havoc wrought by the earthquake.

The principal promenade, *Avenida da Liberdade*, commemorates the liberation of Portugal from Spanish rule (1580-1640) and its three-fold traffic avenues, lined with palms and ornamental gardens, extend for nearly a mile. For the Botanical Gardens, the Museum of Ancient Art and the Museum of Coaches, the visitor turns to the west end of the city, which is given over to the residential quarter and is lavishly endowed with open spaces, gardens, squares and public fountains.

At Belem, still farther west, stands one of the architectural wonders of Lisboa, the Monastery of Jeronimos, begun by D. Manuel I ("the Fortunate") in 1502 to glorify the discovery by Vasco da Gama of the sea-route to India. It is the most accessible example of the exuberant Manuelean style of architecture, in





LISBOA

A general view of the town, with Dom Pedro Square in the foreground

Photo: Photopress

which Renaissance ornament is interpreted in intricate stone tracery, embellished with the Cross of Christ, the armillary sphere, twisted cables, furled sails, and other emblems of the era of Portugal's greatness. Here lie buried the remains of Vasco da Gama and of Luis de Camoens, the author of the national epic poem, *The Lusiads*.

Scenery. The traveller in Portugal has 34,500 square miles to explore, an area only slightly larger than that of Ireland. The country is divided into eleven provinces, the Minho, the Trás-os-montes, the Douro, the Beiras (Alta, Baixa and Litoral), the Extremadura, the Ribatejo, the Alentejos (Alto and Baixo) and the Algarve. He will observe some characteristics which are common to all provinces and some which are purely regional. Considering the smallness of the country the great variety of scenery is amazing. The climate, which is temperate and equable, enables plants of northern Europe to flourish alongside palms, aloes, cacti, mimosa, bougainvillea, tree-ferns, araucaria, eucalyptus trees

and wild flowers of all kinds. The uplands are covered with pine-forests, the waste moorlands with thickets and aromatic herbs. Moisture-laden winds from the Atlantic penetrate to the land frontier, and Portugal, celebrated in verse as "Europe's garden planted by the sea," is watered by the rivers which flow westward from the Spanish plateau. Medicinal springs are common.

Agriculture. The soil is naturally fertile, and about 50 per cent of the population is engaged in agricultural pursuits, with the result that the towns of Portugal are quasi-rural. Vines, olive-trees, and cork-trees are grown all over the country. Table-wines are produced everywhere, and Portugal is the fifth largest olive-oil producing country in the world. Rice, maize, rye, oats, barley, and potatoes are extensively cultivated. Methods of agriculture are primitive, and tractors are very rarely seen. Everything possible is done by hand, men and women working in the fields together from dawn to dusk. The only implement is the *hoc (enxada)* which serves most

purposes. Corn is flailed communally on circular threshing-floors, and grapes are trodden under foot in deep, stone troughs. Fishing is an important industry. Roads generally are good, and railways are being extended to link up remote areas. The mineral resources are largely unworked owing to want of electric power. Coal, pyrites, copper, tin, kaolin and wolfram are produced.

The People. The Portuguese are dark-haired and swarthy of complexion, brown-eyed and short in stature. The sharp cleavage between rich and poor, everywhere apparent in the provinces, is less noticeable in Lisboa and Porto (Oporto), where the middle class of recent years has increased considerably. In the country districts the peasants often go barefoot, and the women walk erect with graceful carriage, balancing their possessions on their heads in bundles, shallow trays, or wicker-baskets.

More than fifty per cent of the population is totally illiterate, and the standard of living is low. The staple diet of the labouring classes, comprising the peasants, fisherfolk, and industrial workers, consists of dried codfish (*bacalhau*), fish of various kinds, rice, beans, maize bread, olive oil, fruit, vegetables, and wine. Meat is eaten only on special occasions, such as weddings, processions and national or local saints' days.

There is no single national dress, but a great variety of picturesque costumes is to be seen. The national pastime of bullfighting, conducted more humanely in Portugal than in Spain, is fast disappearing before the general enthusiasm for athletic sports. The chief amusements of the people, apart from the daily gossip at the market and the ceaseless discussions in the cafés, lie in the celebration of the saints' days, of which the three most popular are St. Anthony, St. John, and St. Peter, whose festivals occur on the 13th, 24th, and 29th June.

Each town and village, however, celebrates its local saint, and the annual *romaria* or pilgrimage combines the act of worship with all the attractions of the fair and occasions the greatest revelry. The women put on gaily-coloured shawls and brilliant cotton dresses with innumerable petticoats, and deck themselves with gold and silver filigree ornaments. The men carry metal-shod quarter-staves and wear sashes and short waistcoats, with broad-brimmed hats or stocking-caps. Popular songs and ballads, handed down by oral tradition,

are sung to the Portuguese guitar, or mandolin, and modified to include topical allusions. The native dances, largely communal and Moorish in origin, are accompanied sometimes by the mandolin, sometimes by the bagpipes and fife.

Most dear to the heart of the people are the plaintive folk tunes (*fados*) which enshrine the racial sentiment of *saudade*, an inexplicable wistfulness or nostalgic yearning. The country is extremely rich in folk-lore, and each local *festa* has its own traditions, often attended by superstitious ritual, the origins of which are obscure. Belief in sirens, witches, and were-wolves persists in remote country areas.

Extremadura and Ribatejo. All this the visitor may see, given the necessary combination of space and time, in any of the eleven provinces. The Extremadura, in which he finds himself if the capital is his point of departure, is divided by the Tagus into two regions. North of the river the Extremeno is more urbane than his provincial brother, for Lisboa, an *entrepot* city, is as cosmopolitan as London. In the capital live 705,000 of Portugal's eight and a half million inhabitants, working in government offices, business houses, the docks, and the factories in the industrial town of Barreiro, south of the river. The most characteristic local industry is the manufacture of gold and silver filigree work.

For his relaxation the city-dweller seeks the Costa do Sol, a series of picturesque, sandy beaches, stretching for seventeen miles to Estoril, the "Portuguese Riviera," a favourite winter-resort of the English. Estoril is protected from the Atlantic rains by the mountain range of Cintra, whose thickly-wooded slopes abound in tropical and subtropical vegetation and provide cool refuge from the fierce heat of Lisboa's summer. From the mountain peaks unfold magnificent panoramas of the Tagus estuary and of the open plains rolling northwards to the monumental convent-palace of Mafra (the "Portuguese Escorial") and eastwards to Torres Vedras, where Wellington's lines held back the French in the Peninsular War, and Carnival is more gaily celebrated than anywhere else in the country.

Cintra's "glorious Eden," immortalized in Byron's *Childe Harold*, is crowned by the Pena Palace, a fantastic imitation of a medieval castle, constructed by Ferdinand of Saxe-Coburg in the nineteenth century. This and the Castle of the Moors on an adjacent peak



PORTUGUESE CONTRASTS

1. The ruins of Palmela Castle.
2. The medieval church of Volareto at Minto: typical of a style which is well marked throughout the country.
3. Fisher-girls in Lisboa.
4. A windmill.
5. A village scene.
6. A royal palace.
7. Ox-cart.
8. Aqueduct at Vilado Conde

Photos: Casa de Portugal; Fox; Orient Line; Wide World



LEIRIA
The Castle and Market Square
Photo: Casa de Portugal

tower above the town, where two curiously shaped conical chimneys mark an ancient Mauresque palace of the fourteenth century, partly Moorish, partly debased Gothic. Here too are the famous park and palace of Monserrate with the finest landscape gardens in the Peninsula.

Within easy reach by rail or road from Lisboa is the ancient fortress town of Santarém. A long avenue, ablaze in April with the pinkish-purple splendour of its judas-trees, leads to the lofty Portas do Sol, commanding an extensive view of the Tagus Valley and the fertile grazing plains where horses are reared and fighting bulls are bred.

Reminiscent of Carcassonne is the walled city of Obidos, with its thirteenth century castle. This is best reached from the Lisboa-Porto highway, which passes through Caldas da Rainha, noted for its warm sulphur springs and its crude but vigorous local pottery, of which the traveller will obtain a specimen before proceeding farther north. Here the heathland alternates with forests where chestnuts, oaks, poplars, walnuts, alders, elms, and limes grow in wild profusion. The prevailing pine is the principal source of wealth of the local industries associated with forest products.

Albergaria is a centre for the export of resin and pinewood props for pits.

Gradually the woodlands give way to a rich, fruit-growing district where oranges, cherries, nesperas, figs, and the ubiquitous grape are cultivated. In this region are situated Portugal's two greatest architectural monuments, the austere twelfth century Cistercian Abbey of Alcobaça, which commemorates the capture of Santarém from the Moors, and the magnificent Abbey of Batalha, executed in Perpendicular Gothic style with lavish Manueline cloisters and "unfinished chapels," a perpetual memorial of Portugal's victorious fight for independence.

Nazaré, the most typical of Portuguese fishing villages, lies to the west, and here the fishermen may be seen launching their crescent-shaped boats or dragging them up the beach with teams of oxen. At Nazaré the fisherwomen have black pork-pie hats with large pom-poms at the side, but the fashion changes at Leiria, where the countrywomen wear feathered velvet hats of pill-box shape and jog their donkeys leisurely to the famous Sunday market. Beneath Leiria's castled crag stretches Portugal's largest pine-forest, planted six hundred years ago to check the encroachment of the sand dunes,

which to-day furnish useful properties for the important glass-making industry at Marinha Grande.

Some thirty miles to the south-east is the little town of Thomar, successively the headquarters of the Portuguese Order of Knights Templar and of the Military Order of Christ, visited chiefly for its magnificent convent-castle (*Convento do Cristo*) where church and cloisters display the wildest extravagances of the Manueline style. The traveller, surfeited with the profusion of pattern and foliation, may soothe his eyes in contemplation of the olive-trees and orange-groves that line the fertile valley of the River Nabão. If he goes to Fatima, between Leiria and Thomar, on the 13th May, he will attend a national pilgrimage in honour of a miraculous manifestation of Our Lady of the Rosary, which occurred there in 1917. Fatima has become the Lourdes of Portugal.

The Beiras. Farther north, beyond Pombal, the Extremadura marches with the Beiras, and a great variety of scenery is to be encountered, from the fertile plains which flank the Tagus

to the wine-growing slopes south of the Douro. The vegetation is multi-coloured and, in the east, not unlike that of the Alentejos. Mountain masses rise towards the Spanish frontier and enfold the beautiful valleys of the Mondego, Dão, and Vouga.

In and around the Serra da Estrela, which, with 6532 feet, is the highest mountain in Portugal, industry is more in evidence. Under favourable climatic conditions, the manufacture of woollen textiles, employing some 8000 hands, is carried on at Castelo Branco, Guarda, Gouveia, and Covilhã. Tin and wolfram concentrates are mined near Viseu. The hydro-electric power dams of the Beiras supply light to the centre of the country.

The casual visitor will be more attracted by the natural beauties of the Serra, and the towns of Covilhã, Manteigas, and Guarda will be his headquarters, whether he seeks relief from the heat of summer in the south or participates in the winter-sports when the mountain is snow-covered. Sheep and goats feed on the mountain-sides, and the Beirão pastor, a sturdy but melancholy individual,



ESTORIL FROM THE AIR
Photo: Casa de Portugal

goes accompanied by huge wolfhounds, their necks protected by spiked iron collars, for wolves are not uncommon in this wild and desolate region.

Douro. To reach Guarda by rail from Leiria the traveller must pass through the artificial province of the Douro. In the south the appearance of the country has much in common with that of the Extremadura. Ar-



PENA PALACE, SINTRA, IN A SETTING OF
TROPICAL PLANTS
Photo: Italian Lines

tesian wells abound and become more frequent as one goes farther north. Land is cultivated in lynchets, or long, narrow, undivided strips, for the traditional system of primogeniture has evolved the farmer-proprietor, and in this region, in the Minho and in the Trás-os-Montes, nearly every peasant is a smallholder and the proud owner of a pair of yellow draught-oxen. Maize, beans, potatoes, rye and barley are widely cultivated, vines increase their stature and rice-fields thrive under the flood-waters of the Mondego, Dão, and Vouga.

On an eminence in the verdant Valley of

the Mondego stands Coimbra, city of culture, tradition and song, its many monuments and public buildings associated with innumerable episodes, some authentic, others legendary, in Portugal's storied past. Here is the seat of the principal University, and the long, black gowns of the two thousand students invest the city with an air of grave and academic dignity. Coloured ribbons, suspended from their portfolios, indicate whether they are studying medicine, science, letters, law, or pharmacy. The forewarned traveller will not miss the traditional ceremonies which accompany "The Burning of the Ribbons," the great academic festival which takes place annually on the 27th May, after a week of youthful revelry, the most memorable event in undergraduate life. Its open parks and gardens make a visit to Coimbra memorable at any time, but spring is perhaps the best season, for then the blossom of the jacarandá-trees shrouds the avenues in an azure haze, and the student's fancy sends him forth to serenade.

Bussaco's "iron ridge" lies to the north, and its mighty forest, incomparable elsewhere in Portugal for the variety of its specimens, climbs to the "High Cross," one of the finest viewpoints in the country. Far below is seen the little town of Pampilhosa, actively engaged in making tiles and terra cotta ware, but better known as the railway junction for the line which leads to the Serra da Estrela and to Spain.

Away to the north-west can be discerned the estuary of the Vouga, where the salt-marshes provide Aveiro with its principal occupation. Aveiro, commonly known as "the Venice of Portugal," is more akin to a waterway town of Holland, and its canals and lagoons provide a rich variety of aquatic plants. The coastline stretches away northwards to the fishing village of Ovar, second only to Nazaré in picturesqueness and traditions.

Porto cannot be seen from Bussaco, but a two-hours' train journey will bring the visitor to the narrow gorge of the Douro, on the steep banks of which "the Manchester of Portugal" lies huddled. This is the heart of the wine-producing region, and the terraced vines which crowd on either bank of the turgid current produce the grapes from which port-wine is made. The visitor who goes "up the Douro" for the vintage (25th September-20th October) will long remember the files of men and women carrying enormous wicker baskets laden with the luscious fruit to the great stone wine-presses, where at night the grapes are trodden

by chains of men linked arm in arm and marching barefoot to and fro to the strains of the guitar and violin.

Though Porto's wealth is derived chiefly from the wine-trade, the dampness of the climate is favourable to the cotton industry, and cotton mills in this district employ some 35,000 hands. Gold and silver filigree work is a local industry, as in Lisboa.

a richly ornamented, Moorish *canga*. The shepherd of the hills wears a waterproof cloak of reeds, contrasting strongly with the brilliant costumes worn by the peasants at Viana do Castelo, the seaport town nestling below the heights of Santa Luzia.

South of Viana, at Souto das Neves, there is enacted on 5th August the *Auto de Floripes*, a traditional mimic combat between Moslems



THE HILLS OF NORTHERN PORTUGAL

A mountain road passing through the vineyards

Photo Casa de Portugal

Minho. In the northern seaboard province of the Minho the traveller encounters a region reminiscent of England, so varied and rich is the vegetation, due to the mists and springs. The province is watered by the Rivers Lima and Ave, and by the Minho, which forms the northern frontier. The vines here grow to great heights and are trained on granite pillars, forming pleasaunces in the fields and streets. Rough, granite masses protrude through the soil, and the peasant constructs not only his dwelling of granite but also the fences of his smallholding. The Minhoto, a devout, silent man, is very Galician in character, physique and dialect. His oxen are yoked in pairs with

and Christians, with a medieval play as epilogue; and at Braga, famous for the national *romaria* or pilgrimage to the great staircase of Bom Jesus, a strange folkloric survival, known as the *Dance of King David*, may be seen on St. John's Day.

Trás-os-Montes. In the adjacent province of the Trás-os-Montes ("beyond the mountains") the visitor finds himself in the wildest and most inaccessible part of Portugal. Eternal snow lies on the mountains which are bare and inhospitable, but in the valleys the soil is richer and the vegetation is not unlike that of the Alentejos. Forests and cistus-covered glades are found on the lower slopes. Wine is the

chief product, but wolfram is mined near Bragança. The shepherds differ from the Minhotos in that their long waterproof cloaks are made of straw. From the remote village of Miranda do Douro come the *Pauliteros*, or stick-dancers.

The Alentejos. If, from Lisboa, the traveller ventures south of the Tagus, he will find in the seaport town of Setubal the third largest city of Portugal and the chief centre of the



BRAGA
The Church of Santa Cruz
Photo Casa de Portugal

sardine-canning and export industry, a region famous also for its oranges and Muscatel wine.

From here it is but a step to the Alentejos, where vast rolling plains are once again becoming a great wheat-producing area. The rainfall is slight, but a vast scheme of hydraulic engineering in the Sado Valley is improving irrigation. Wide tracts of uncultivated moorland, overgrown with cistus, are given over to sheep, pigs, and cork trees.

The Alentejo peasant, picturesquely attired in brown sheepskin swallow-tails and broad-brimmed hat, is a lonely, uncommunicative individual, for his is the most sparsely populated province. Here, and in the Algarve, Moorish and Berber types may be met, together with an admixture of negroid, due to the importation of slave labour in the fifteenth

and sixteenth centuries. The principal towns are Portalegre, a cork centre; Évora (the "Portuguese York"), famous for its Midsummer Fair; Elvas, renowned for its preserved fruits; and Beja.

Algarve. The Algarve might almost belong to north-west Africa. Its atmosphere is utterly Moorish, with its white flat-topped houses and outside staircases huddling together in close-packed towns. The climate is favourable to the cultivation of flowers and fruits, and figs, oranges, pomegranates, grapes, and almonds grow, almost untended, on the wooded slopes, while the Algarvio, a loquacious fellow like his Spanish neighbour, the Andalusian, goes tunny-fishing. Olhão, Vila Real, and Lagos are the centres of tunny and sardine-canning.

The traveller who visits the Algarve in early March will find the province at its best, for then the almond trees are shedding their blossom, and the soil is carpeted in white. Cloudless skies and a Mediterranean climate are making the Algarve a popular winter resort and Praia da Rocha is being developed.

Portugal is a country which, having attracted the attention of the traveller, holds his interest and bids him stay.

OVERSEAS POSSESSIONS OF PORTUGAL

In Asia Portugal has the small provinces of Portuguese India, 1500 square miles, population 637,800; Macao, in China, at the mouth of the Canton River, population 187,800; and the eastern part of the island of Timor in the Malay Archipelago (see Southern Asia and Indonesia).

Portuguese possessions in Africa are: Angola or Portuguese West Africa (see Africa: Intertropical Africa), capital São Paulo de Loanda, area 487,788 square miles, population about 4,400,000; Mozambique or Portuguese East Africa (see Africa: Intertropical Africa), capital Lourenço Marques, area 297,654 square miles, population about 5,732,800; Portuguese Guinea (see Africa: Intertropical Africa), area 13,944 square miles, population 517,250; the São Tomé and Príncipe Islands (see Africa: Intertropical Africa), 125 miles off the Guinea coast, area 384 square miles, population 60,160; and the Cape Verde Islands (see Africa: Islands of the Atlantic), area 1557 square miles, population 147,000. Farther north in the Atlantic lie Madeira and the Azores (see Africa: Islands of the Atlantic), administratively parts of the mother country.

THE LOW COUNTRIES

(The Netherlands, Belgium and Luxembourg)



AN AERIAL VIEW OF DUTCH SCENERY

The fields are divided by canals, not hedges as in England. Where the canals appear to be broken the water is covered by weed, which will be cut away and used to manure the fields

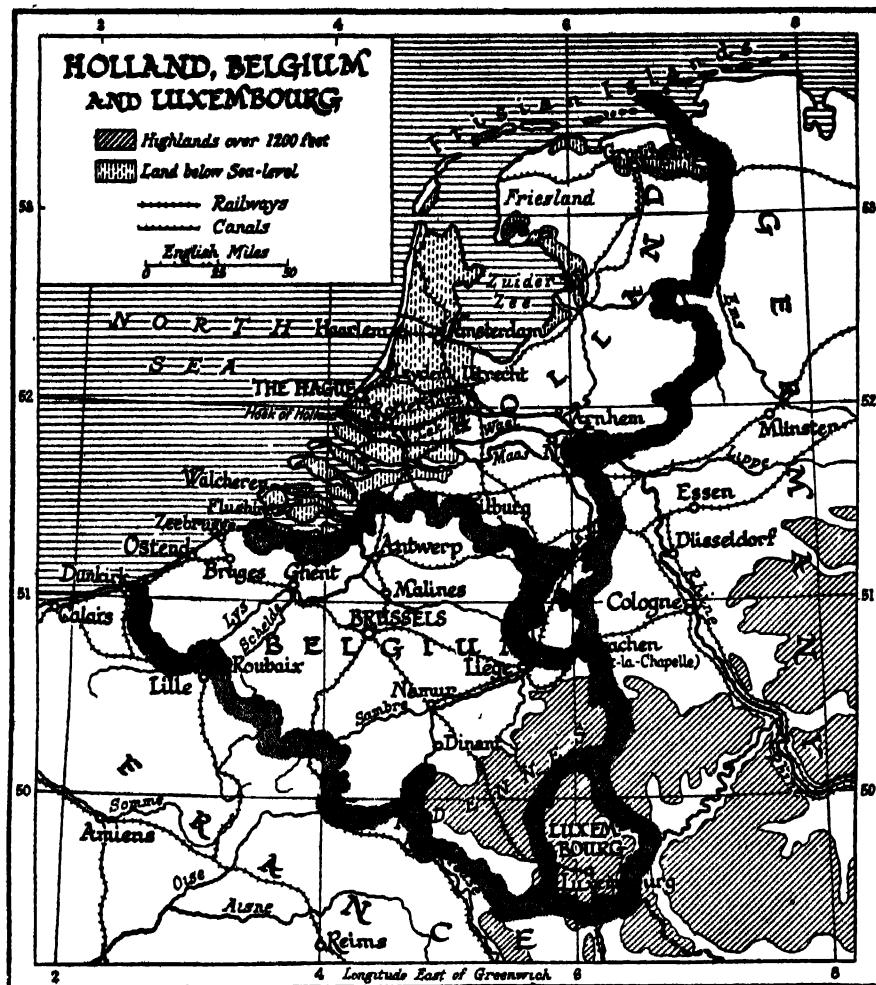
Photo "KLM" Royal Dutch Airlines

The Netherlands

OF most races it can be truly said that they are the products of their geographical environment. This is especially true of the seafaring and agricultural Dutch; but, paradoxically enough, it is almost as true to say that the geographical environment of the Dutch is a product of the Dutch themselves. For centuries the Dutch coastline has been in flux. The superficial area of the Netherlands has varied and still varies from decade to decade. A furious struggle is continually waged: offensive—to wrest new land from the sea; and defen-

sive—to drain and protect the ground that has been reclaimed.

From the middle of Belgium, through Hanover, Holstein and Prussia, and as far as the Soviet Union, runs the monotonous and sandy plain characteristic of northern and western Europe. Through this plain great rivers run down to the sea—the Schelde, Maas and Rijn (Rhine)—and in the delta country made by these rivers, lying north of the Schelde estuary and south of the mouth of the Ems, are the eleven provinces of the Kingdom of the



ALTERNATIVE PLACE NAME SPELLINGS

Antwerp = Anvers; Bruges = Brugge; Brussels = Bruxelles; Cologne = Kolin; Ghent = Gand;
The Hague = Den Haag; Ostend = Ostende

Netherlands, forming a rough semi-circle around the inland Zuider Zee, which is itself destined to become a twelfth Dutch province.

As the sluggish rivers move slowly on their winding course towards the sea they deposit the alluvium from which the Dutch border provinces have been born. The river channels silt up. New channels are broken. Meanwhile a continual process of erosion by the sea goes on. In this game of "land-taking and land-making" the Dutch people are active participants.

A brief description of the country's relief will throw some light on the problem facing the Dutch in their fight against the sea. The three westerly provinces, Zeeland and Noord- and Zuid-Holland, facing the North Sea, lie almost entirely below sea-level. In some places the land is as much as sixteen feet under the level

of the sea. Zeeland, the most south-westerly of the provinces, can be summarily described as formed by the estuaries of the Schelde, the Maas (Meuse) and the Waal (or southern branch of the Rhine). The first of these rivers issues to the sea through two channels, the Hond (or West Schelde) and the Ooster Schelde; between these two arms of the river lie the islands of Noord and Zuid Beveland and the island of Walcheren, with the old fortified town of Middelburg in its centre, and its sea-face protected by the famous Westkapelle dyke.

North of the Ooster Schelde are the islands of Schouwen and Tholen, both of them still part of the province of Zeeland, though the latter will perhaps one day be connected with the mainland as a part of Noord-Brabant. North of Schouwen are the islands (to-day joined together) of

Goedereede and Overflakkee, administratively a part of the province of Zuid-Holland and separated from the mainland by the waters of the Haringvliet and Hollandsche Diep, the broad channel through which the South Rhine and the Maas reach the open sea.

Still farther north stretches the province of Noord-Holland—a peninsula with the North Sea on one side of it and the South Sea or Zuider Zee on the other. The Zuider Zee, whose continued existence is now threatened by the Dutch engineers, was itself brought into existence by an eruption of the North Sea some seven hundred years ago. The continental part of the province of Noord-Holland ends at Helder but is continued by the West Friesian Islands, Tessel (Texel), Vlieland, Terschelling, Ameland, Schiermonnikoog and Rottumeroog. Zeeland and Noord- and Zuid-Holland, as

has been said, are the lowest lying of the Dutch provinces. South and east of a line joining Utrecht, Breda and Bergen-op-Zoom the high land begins. The word "high" is used here in a relative sense only, for as much as two-thirds of the entire country is less than thirty feet above the level of the sea and would, save for the protection afforded by dykes and coastal sand dunes, be flooded at every high tide. The soil of the low-lying border provinces is alluvial—a sea-clay carried down in the first place by the great rivers and deposited in the sea, to be converted later into dry land by the process, described below, of *impoldering*.

The diluvial region, covering about 40 per cent of the total area of the country, comprises the provinces of Drenthe and certain adjoining parts of Groningen and Friesland, Gelderland, Overijssel and a part of Utrecht, and almost the whole of Noord-Brabant and Limburg. This section of the country is generally higher than the wide strip which borders the sea, and, for Holland, rises to quite imposing elevations as the southern province of Limburg is approached. The general impression conveyed by the relief map of Holland is that of a country sliding down into the sea.

The Battle with the Sea. It has often been pointed out that Holland is a land without natural frontiers. There are no geographical reasons why the Belgian or German frontiers should end where they do, and the Kingdom of the Netherlands begin. There are only historical reasons. But if this is true of the

frontiers which Holland shares with other states, it is no less true of that shifting and changing frontier bounded by the North Sea.

The soil of the sea-board provinces—sand, clay and peat—is easily eroded by the action of the sea. Against the invading waters, which in the past won such considerable victories as the inundation of the Zuider Zee, of the Lauwers Zee and of the Dollart, and more recently (1953) of practically the whole south-western part of the country, Holland has one natural bulwark in the sand dunes that line her coast between the Maas estuary and the Zuider Zee entrance. These dunes sometimes reach a height of 180 feet and have been thickly planted with sea-bents and sea-reeds to increase their firmness and stability.

The war against the sea is, however, based upon the principle that the best form of defence is attack; and it is not for nothing that, in Holland, the engineers enjoy the distinction of being called the "Senior Service." The volume of alluvial deposits brought down by the great rivers each year is large. The amount is estimated to average more than five hundred million cubic feet annually, a quantity which, if spread evenly to a depth of one foot, would cover almost two square miles.

Impoldering. If we take our stand upon the wall of a sea-dyke, and look down upon the exposed beach, we will be able to distinguish two clearly marked zones. That which is farthest away, towards the sea's edge, is called the *slikke*. At low tide it lies grey and muddy,



ZOUTELANDE

A village in the dunes of the south-west coast

Photo: Netherland Official Tourist Office

shining in the sun. At high tide it is completely covered. Nearer to where we are standing, above the high-water mark, is a stretch of land on a slightly higher level. Here thick coarse grass is growing. This strip, called in Zeeland *schorren*, in Holland *gorzen*, and in the neighbourhood of the Zuider Zee *wierwaarden*, is only under water at the time of the spring tides, or when storms pile up the waters and threaten the dykes. It represents a sufficiently advanced stage in the creation of new soil to allow of the pasturing of sheep and cattle. When the *schorren* have reached a height of from thirty to fifty centimetres above sea-level, they are ready for *impoldering*. A dyke is constructed cutting the land off from the sea, and the *schorre* has become a *polder*.

The process of land-making is one which has been going on for centuries. The present island of Walcheren has been formed from three smaller islands which, at the end of the fourteenth century, were entirely separate one from the other. Ships from Anvers could sail right into Middelburg. This route ceased to be practicable in 1480. Another example; the *polder* of Oudenhorn was reclaimed in 1356, and was later built up into the island of Voorne. A channel, the Bornisse, separated this island from that of Putten. During the sixteenth and seventeenth centuries the Bornisse was gradually dyked off and to-day Voorne and Putten form a single island. The building up of *schorren* and their progressive endyking is also proceeding rapidly in the channel that separates Zuid Beveland from Noord-Brabant.

Zuider Zee Reclamation. The most impressive reclamation scheme which the Dutch engineers have ever had in hand is that of enclosing and draining the Zuider Zee. This enterprise was begun before the economic crisis of the 1930's and in spite of the fact that a decision was taken in 1931 to delay the work, the dam across the sea was completed, but for one section, in that year. To-day the dam is finished, and motor traffic crosses it from side to side.

The north-western section of the Zuider Zee, a total of 17,500 hectares, is now completely reclaimed; and although the land only fell dry on the 21st August, 1930, there were already 400 houses and barns built and forty kilometres of road constructed by the end of 1931, and by 1936 three villages already occupied the *polder*. The next section to be reclaimed was the north-east, covering nearly 48,000 hectares, and work on this was finished

in 1942. Planning for the south-west and south-east *polders* is in progress.

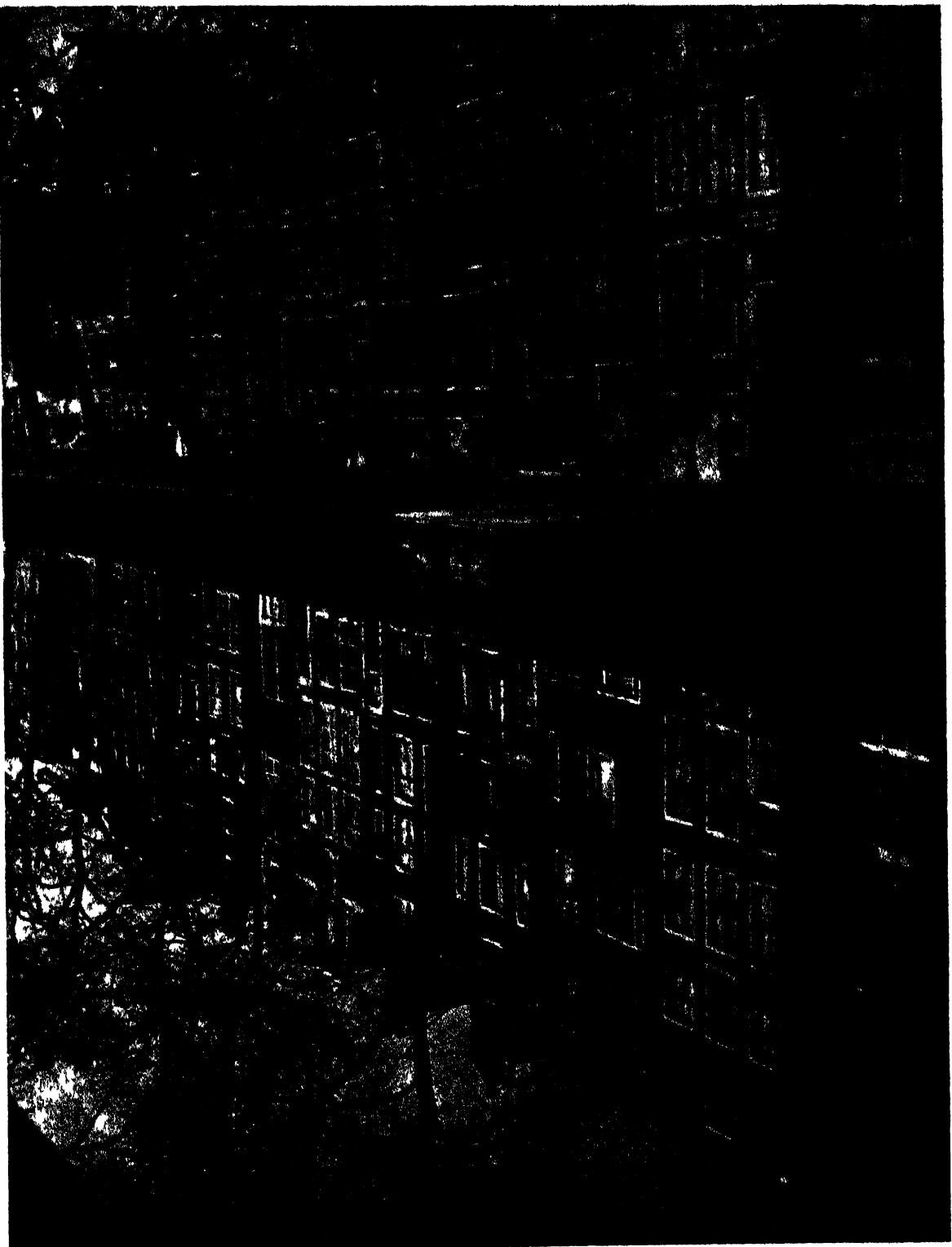
It must not be thought that the reclaiming of land from the sea is the only kind of reclamation that goes on in Holland. The sandy wastelands lying in the belt of higher land that borders the coastal plain also receives the attention of the Dutch engineers. The Nederlandsche Heidemaatschappij, founded in 1889, is gradually conquering these arid stretches, planting grass on them, and turning them into land which ultimately, with intensive manuring, becomes suitable for arable farming.

The "Hollow Land." The country is one of land and water. Everywhere the "hollow land," as the Dutch call their country, is traversed by canals and irrigation ditches. No hedges separate the fields: ditches are sufficient to keep the cattle from straying, and where the ditches are interrupted by the little hummocks of land that join one field to the next, the great five-barred gates stand out abrupt and isolated against the flat horizon. Stretches of water choked with reeds alternate with fields of vividly green grass; this vivid green is the colour-impression that stays longest in the mind of the visitor. Only in the Haarlem tulip country when the flowers are in bloom has it a rival.

Sometimes the water-level of the canals, held between powerful embankments, is higher than that of the fields through which they flow, and then we get the odd picture of an occasional sailing barge that somehow seems to be crossing the face of the land with no water in sight. The barge traffic through the canals of Holland—the broad-bowed *trekschuiten* are most commonly used—is very great, and the typical Dutch village straggles in a thin line along the canal side. At intervals, marked by the upright posts of the drawbridges, roads cross the canals.

The landscape, though flat, is never uninteresting. This is partly due to the trees that so often line the roads—we have only to think of Hobbema's "Avenue at Middelharnis" to bring the scene before us—and partly to the amazingly beautiful cloud effects that seem always to fill the sky. Here again a painter can help us to visualize what is so difficult to describe. The landscapes of Jacob van Ruisdael and Vermeer's "View of Delft" portray one of Holland's beauties which the passage of time has been unable to change. That other landmark, the windmill, is to-day rather less common than in the past.

The Dutch are more an urban than a rural



THE HEERENGRACHT, AMSTERDAM
Photo Netherlands Information Office

(G 109)

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PEOPLE OF THE NETHERLANDS

1. Women of Spakenburg. 2. In the main street of Volendam, a fishing village on the Zuider Zee. Boys until over eleven years old wear skirts like the girls. 3. Fisherfolk. 4. Thatched farm dwelling. 5. Islanders of Marken, the Protestant village in the Zuider Zee. 6. Dutchmen waiting at a level crossing in Hilversum

Photos: *Netherlands Official Tourist Office; Charles Mougnat*

people; or perhaps it would be truer to say that the distinction between rural and urban is less pronounced in Holland than in most other countries.

Counting communities of over 2000 as urban, as much as 94 per cent of the population may be thus classified, leaving only about 6 per cent to be described as being genuinely rural. No town is very far away from the next, and between the towns the villages, some of a respectable size, are almost contiguous. The bond between the towns and the "urbanized" countryside is a close one. Nearly every town, large or small, has its agricultural market, and consequently has a close interest in the life of the villages.

Dairy farming and the breeding of cattle are the rule in the seaboard provinces, the chief products being meat, butter, and cheese. Every farmer in these parts fancies himself as a seller or buyer of cattle, and frequents the cattle markets of Alkmaar, Hoorn, Purmerond, or Amsterdam. Alkmaar is also renowned for its Friday cheese market, where the neatly-piled pyramids of round red cheeses are inspected and bid for. In other parts of Holland the cheeses are usually sold on the farm itself—this is especially true of the district surrounding Edam—and the buyer conforms to the normal rule of visiting the seller.

Much has been written about the cleanliness of Dutch homes, but on the farms an equally high standard of cleanliness will be found in stable and cow-shed. "Milk from contented cows" seems to be a Dutch as well as an American slogan. Most of this dairy farming, which is almost dictated to the Dutch by the richness of the grass that grows on the old *polders*, produces for an export market. But through economic causes Holland is turning from dairy to arable farming.

The *polders* which have only recently been reclaimed, and which are usually better drained than the older reclaimed land, are very suitable for arable farming. In these districts horse husbandry is the rule, and crops of wheat, sugar beet, cabbages and peas are raised. Horticulture is an even more important part of the agricultural scheme. The fields between Haarlem and Leyden, bright with tulips in April and May, are too well known to need description, but their economic importance is considerably less than that of some of the less picturesque crops, such as cauliflower, spinach, tomatoes, carrots and asparagus, raised largely under glass.

The Towns. The fields end and the towns begin with startling suddenness. The new suburbs of Amsterdam, for example, rise abruptly from the countryside and they present



HYACINTH FIELDS

Hyacinth, tulip, and other bulbs are grown and exported to every part of the world
Photo. Netherland Official Tourist Office

a wall of houses to the arriving traveller as definite as the wall that surrounded the medieval city. Few of the towns of Holland have the straggling suburbs so often found in England, and the problem of "ribbon development" is unknown.

An historic, old and remaining core, the centre of newly-built and well-planned modern districts, is the scheme followed by the typical Dutch town; a ground-plan which also provides a clue at once to the age and history of the city. For Dutch towns are as a rule—Rotterdam is an exception—of ancient foundation. The sixteenth and seventeenth centuries have seen, in all probability, their golden age, and the eighteenth century their decline, followed in the nineteenth by a gradual recovery and in the twentieth by a process which amounts to a veritable renewal. This characteristic historical scheme will be seen at its clearest in Amsterdam.

The Dutch towns are all, with the single exception of Den Haag, situated on rivers and intersected, even honeycombed, with canals—in Holland called *grachten*. Utrecht, on the Kromme Rijn, began as a Roman military post; and its name probably derives from the Latin "*trajectum ad Rhenum*." Between 1500 and 1700 it was Holland's greatest textile centre; and its University, founded in 1636, dates from this period. Deserted by the textile trade, the town's importance dwindled. The high tower, all that remained of a once famous cathedral, dominated the countryside. The farmers still gathered in the city on market days. But the growth of industrialism led to a revival, and to-day Utrecht boasts of railway shops, sugar refineries and a growing chemical industry. Population (1950 estimate), 195,100.



MARKET DAY AT MIDDLEBURG
Photo. Schofield

Rotterdam. This city on the River Lek is comparatively new, its prosperity dating only from about the last third of the nineteenth century. Rotterdam's rise to commercial importance coincided with and depended upon two factors—the industrial development of the German Rhineland, and the construction (1863–1900) of the Nieuwe Waterweg, a waterway thirty-three kilometres in length connecting Rotterdam with the Hook of Holland and the North Sea. Population (1950 estimate), 684,660.

Den Haag. The administrative capital of the Netherlands is the arbitrary product of a princely will rather than a slow growth fostered by a favourable geographical environment. Though situated near the sea, it is not a port and handles none of Holland's trade. Nevertheless it is the richest town in the country, contributing 17 per cent of the revenue raised by taxation as compared with Amsterdam's 11 per cent. The spirit of Den Haag is that of the



IN ALEMAAR CHEESE MARKET
Photo: Netherland Official Tourist Office

tidy-minded civil servants and of the fussy and meticulous retired proconsuls and businessmen who make up the greater part of its population. Public clocks abound on the street corners and insist on keeping precisely to the right time. Neat trams run down the wide and tree-lined streets. The modern city's architecture, except for the solemn hideousness of the justly famous Peace Palace, is undistinguished. Only in the very centre of the town, in the streets and buildings that lie around the Vijver, do we come upon historic Holland. Here are the Binnenhof and Buitenhof, where Holland's parliament meets, and the Mauritshuis, which houses a small but nearly perfect collection of paintings. Here too is the Lange Voorhout, in the writer's opinion the loveliest street of any European city.

In spite of its general air of calmness and sobriety Den Haag is a pleasant town. The hunting lodge from which it grew was once no more than a clearing in the forest, and the forest is there to-day, stretching between the town and its seaside suburb of Scheveningen. The nearness of the beaches, and the pleasant walks that can be taken through the Haagsche Boschjes, as these woods are called, are a more

than sufficient compensation for the somewhat crushing respectability of the town. Population (1950 estimate), 560,000.

Amsterdam. To all this Amsterdam is in deep contrast. While Den Haag has few canals, Amsterdam has more than any other city in Holland. Its whole history has been that of struggle with the water. It is situated at the point where the Amstel River flows into the Ij, itself a branch or arm of the Zuider Zee. Its very name suggests the importance of the dam that was built to contain the Amstel. Water is also a problem to the Amsterdamer in other ways. The soil on which the city is built is extremely marshy, and the foundation of every house must consist of innumerable piles sunk into the ground. The Royal Palace, constructed between 1648 and 1655, is said to rest on 13,659 of them; and even to-day the noise of the pile-driver is never stilled in the city. The superficial area available for building is small, and the houses, unlike those of other Dutch towns, are usually high and narrow.

The age of Amsterdam, and the successive stages of its enlargement, can be easily traced from the ground-plan of the city. The river Ij, running east and west, has a little southward



A PRE-WAR AERIAL VIEW OF ROTTERDAM

The second largest city in the Netherlands and one of the most important commercial ports in Europe

Photo: "K.L.M." Royal Dutch Airlines



THE PORT AT GRONINGEN

This important commercial centre is connected by canal with Dollart Inlet

Photo Netherland Official Tourist Office

bend at the point at which the town has grown up. On the southern side, the plan shows a series of horseshoe-shaped canals, each larger than the next, and all with their arms pointing towards the river. The innermost and oldest of these canals is the Singel: it is followed by the three great *grachts*, the Heerengracht, the Keizersgracht and the Prinsengracht, a diminishing hierarchy. Each of these *grachts*, all of them dating from the seventeenth century, marks a new boundary of the town. The Amstel cuts across them on its way to the Ij, and the Binnen Amstel passes through the city's Jewish quarter, the refuge of the Spanish and Portuguese Jews expelled from their countries in the fifteenth and sixteenth centuries. The *grachts*, with their green water, their avenues of trees down which we look from the bridges, and their imposing houses, are among the most beautiful sights of the city. The growth of Amsterdam, made necessary by its modern population of more than three-quarters of a million, has been a planned growth, and the old town is now surrounded by spacious and well laid out residential suburbs.

Amsterdam has been the principal com-

mercial centre of the Netherlands since the fifteenth century, and originally owed its importance to the fact that the trade route between Hamburg and Flanders passed through it; and in bygone times Amsterdam was affiliated to the Hansa League. Geographically, it was also connected by the Zuider Zee route with England and the Baltic, and by the Rhein with K^oln and Germany. In the seventeenth century it dominated the commerce of the world. Later, after the rise of England to world importance as a trading nation, Amsterdam declined. Its renewal began after the constitution of the Kingdom of the Netherlands in 1813, and advanced even more rapidly after the foundation, in 1824, of the Handelsmaatschappij for the exploitation of the East Indies. Imports of such products as tobacco, copra, rubber, coffee, tea, sugar and pepper from the former Dutch East Indies (now the Republic of Indonesia) still play a leading part in its trade. Between 1865 and 1876 the fifteen mile long North Sea Canal, giving Amsterdam direct access to the open sea, was completed, and the modern town's growth received another stimulus. Population (1950 estimate), 845,270.

Economic Structure of Holland. This is inextricably bound up, to a far greater degree than is true of either Belgium or the Scandinavian countries, with those of the world as a whole. Though agriculture is of primary importance, Holland has considerable manufacturing and industrial interests; and is moreover an important commercial and financial centre. Her geographical position at the mouth of two rivers whose hinterlands are highly industrialized has given her a large *entrepot* trade, a trade which is sensibly increased by the volume of imports that arrive from her former Asiatic empire. World economic conditions, the prosperity or otherwise of neighbouring countries, the prices ruling on the world market, all play a decisive part in determining the state of economic health enjoyed by the Netherlands.

The important and growing share which industry takes in the economic life of the country is shown by the following figures taken from official Occupational Census returns. Those dependent on industry for a livelihood numbered 770,000 in 1909; 1,236,000 in 1930; 1,349,000 in 1950. Comparable figures for agriculture were 618,000 in 1909; 689,000 in 1930; and 747,000 in 1950. The industrial figures, in other words, are well on the way towards doubling; while those for agriculture seem to have shown practically no change. In actual fact, the trend towards industrialization has not been quite as rapid or as decisive as these figures would suggest.

In the first place, certain foodstuff industries which, in the 1909 census, were included under the heading "agriculture," have now been transferred to the heading "industry." By 1920, out of 1,028,000 then reckoned as employed in industry, 177,000 belonged to these transferred categories—finishing industries concerned with milk, butter, and cheese. In the second place it must be remembered that "light" and not "heavy" industries predominate in Holland. It is the factory landscape of southern England rather than the picture presented by our Black Country or by our industrial north that is best compared with the Dutch industrial scene. But even when we have made all these corrections, we will find that industry and agriculture in the Netherlands give employment to about equal numbers.

Drawing an industrial map of the country, we would begin by showing, in the southerly province of Limburg, her small but productive coal-field, which is an extension of the Belgian

Kempen and German Westphalian coal areas. The iron and steel works, and some important machine-building enterprises, are situated along the lower reaches of the Maas. The textile industry is located mainly in the province of Twenthe, though much cotton-spinning is done in Overijssel and weaving in Noord-Brabant. Gouda is the present, as Delft is the traditional home, of the manufacture of tiles and pottery.

The agricultural and foodstuff industries, such as the manufacture of flour, biscuits, margarine and preserved milk, are centred round the great ports, as are also those industries that "finish" for re-export Holland's imported overseas products such as rice, cocoa and tobacco. In Amsterdam, Rotterdam, Haarlem, Dordrecht and Vlissingen (Flushing) are the principal shipbuilding yards, grievously hit by the world economic crisis, and still only a shadow of their former prosperous selves.

The existing contours of economic life and the trend of development of industry and agriculture cannot be understood unless we take into consideration the following four facts: *first*, the extreme dependence of Holland upon world economic conditions; *secondly*, that Dutch agriculture has been principally developed for an export market; *thirdly*, that Dutch industry caters to a much greater extent than does agriculture for the domestic market; and *fourthly*, that the depression of 1929 to 1934 led, in Holland, to the adoption of economic policies deliberately designed to alter both the balance between agriculture and industry, and the balance, within agriculture itself, between arable farming and the dairy and cattle industry.

The first of these points need not be laboured. In the years immediately following the 1914–18 War Holland enjoyed a considerable prosperity, a prosperity which was enhanced by the excellent economic conditions prevailing in the Dutch overseas empire and especially, from 1924 to 1928, in the Netherlands East Indies. The conditions of life of the lower and middle classes were steadily improved. Social services such as education, housing and hygiene, were maintained at remarkably high levels. Wages were also high, and the costs of production incurred in Dutch industry and agriculture were correspondingly heavy. The economic crisis of the 1930's threatened and then curtailed these gains. Dutch incomes from the capital investments of her citizens in the Netherlands East Indies dwindled away as a result of the collapse of the price of sugar (Java's most



DUTCH ARCHITECTURE

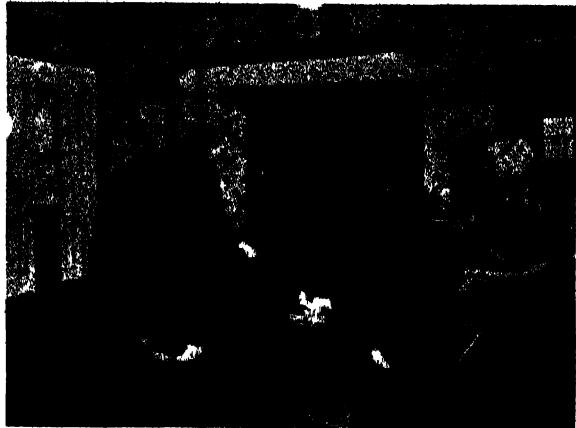
1. Old buildings by a canal in Utrecht. 2. Town Hall, Hilversum. 3. Old windmill in the centre of Rotterdam at which corn was still ground up till 1939.
4. Woerden, typical of scores of small towns and villages. 5. Pier at the holiday resort of Scheveningen. 6. Morschgate, Leyden; drawbridges of this type
spanning the canals remain in many places

Photos: Netherland Official Tourist Office, Charles Mougin

important crop), and of rubber, tobacco, tea and coffee.

Holland, it must be remembered, is also a traditionally free trade country, and her home market was only slightly protected. Even in such an industry as the manufacture of cycles, and cycles are almost as numerous in Holland as human beings, the Dutch producers had to meet keen competition from English makers. At the height of the economic crisis ship-building had almost ceased. The engineering industry was very badly hit. Wireless and electric lamp manufacturers (amongst the most important of Dutch light industries) had the greatest difficulty in finding export markets for their products. The porcelain industry, though awarded the protection of a quota system, had entirely lost its foreign markets. The same was true of the boot and shoe industry. Dutch textile concerns, whose markets even in the East Indies were threatened by foreign competition, agitated for the putting into force of a quota system which would enable them to maintain their position there; but this the Netherlands East Indian Government, having in mind the interests of the native consumer, refused to do. The fertilizer industry, which in normal times could count upon a good home market, was also in difficulties as the farmer, owing to the low prices which he was receiving for his agricultural produce, was unable to place orders. In agriculture a similarly gloomy position was evident.

The *polders*, protected by dykes, for the most part below sea-level, having no natural drainage, possess a moist soil upon which grows rich grass highly suitable for the pasturing of cattle.



INTERIOR OF A FARM DWELLING
Photo Netherland Official Tourist Office

Roughly one-third of the country was given over to grassland. Hence the importance of Holland's cattle and dairy farming, and the large output of milk, butter and cheese, for export and sale abroad.

The world economic crisis considerably curtailed foreign purchasing power, and so, faced with diminishing markets, Dutch agriculture had to be reduced. The accent was shifted to arable farming. In the Dutch economy as a whole, the emphasis had to be placed on industrialization and an increasing degree of self-sufficiency, and not on agriculture as before.

Even when her products could be successfully disposed of abroad, Holland was faced with the falling prices for agricultural commodities that ruled on the world market. Something was done by diminishing agricultural costs of production, but even here there was little scope. Wage reductions were of only limited value because of the small proportion of labourers to landholders. In 1931 the number of landholders was estimated at 220,000, and the number of labourers at only 400,000. The only possible solution was a re-orientation of Dutch agriculture from pasture to tillage.

Solving the Economic Problem. The nature of the problem in 1930 is shown by figures; the output of dairy and cattle produce was valued at 791·5 million florins; that of horticultural produce at 203·5 million florins; and of arable produce at 161·5 million florins. The real significance of these figures only becomes apparent when we remember that dairy farming, the poultry industry, the production of pigs, market gardening, and the flower and bulb industries, were all dependent upon foreign markets for the sale of the greater part of their produce.



FISHING CRAFT AT VLISSINGEN (FLUSHING)
Photo Netherland Official Tourist Office

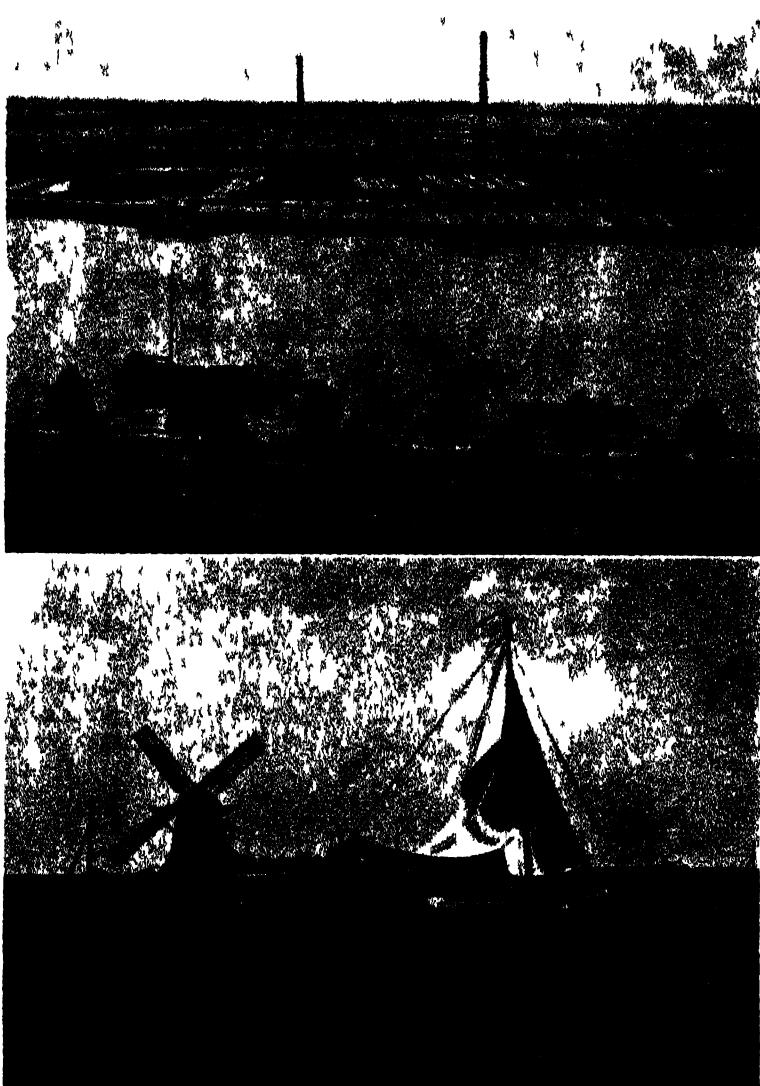
To deal with this situation a Ministry of Economic Affairs was created, and later divided into a Ministry of Agriculture and a Ministry of Commerce and Industry. The policy pursued by the former, and implemented by such legislation as the Wheat Act and the Agricultural Crisis Act, was one of the restriction of production for export and the encouragement of farmers' raising crops for domestic consumption. The Agricultural Crisis Act in particular, originally passed to protect agricultural producers and guarantee them an adequate economic return for their output, was gradually developed until it became an economic planning agency for almost the whole of agricultural production.

By 1939 a complicated system of subsidies and bounties to exporters, and of levies on domestic consumption, had grown up. The cultivation of native wheat had been greatly stimulated by the Wheat Act, and much grassland had been converted into arable. Land rents had been reduced by statute. Subsidies and quotas had given protection to the producers of wheat, potatoes, sugar beet and flax. Schemes for a restriction of output, reminiscent of those adopted by the Roosevelt administration in the United States of America, had been successful in reducing the number of cattle in Holland by 190,000 head during the period May, 1934, to March, 1936, though an equivalent decrease in the amount of milk produced did not follow. Bacon production had been limited to an amount which was more or less equal to the domestic demand plus the actually possible volume of exports.

Even in the Dutch fishing industry schemes of voluntary restriction were put into operation. Herring fishing was not allowed to commence until the end of May and closed at the beginning of December, while a smaller number of nets per fishing boat was used.

The spread of systematic government planning and control, and the multiplication of regulations of one sort and another, though greatly benefiting the farmers, were not without their attendant disadvantages. Restrictions on normal trading led to considerable trustification in, for example, the wheat milling and the bacon curing industries. The artificial maintenance of domestic prices at high levels through a deliberately created shortage of supplies, or through the imposition of levies, was, moreover, not without its effect upon the cost of living.

Holland, as we have pointed out, is at least as much an industrial as an agricultural



CANALS AS ARTERIES OF COMMUNICATION

Above Brickworks on a canal at Arnhem Below Fishing vessel on the Merwede Canal
Photos Netherland Official Tourist Office

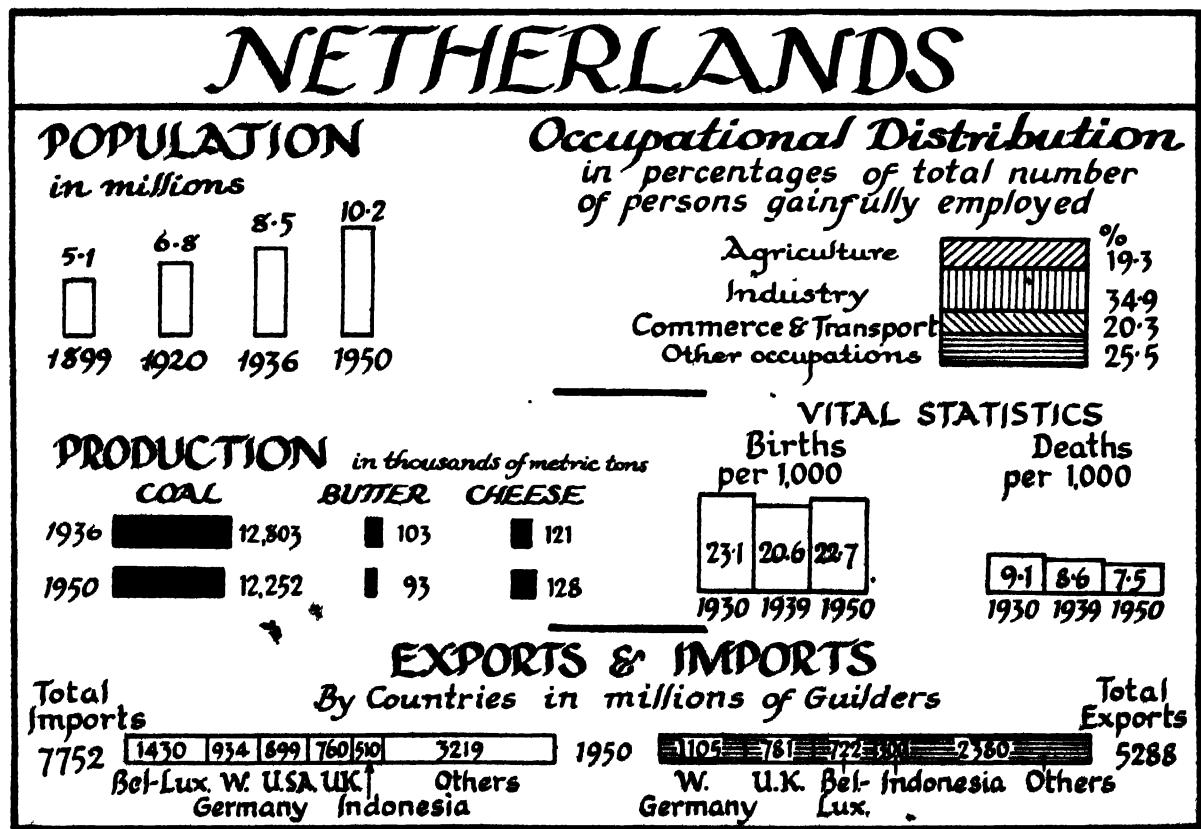
country, and the need for a planned agricultural programme is reinforced by the conditions that prevail in industry. Imports have to be paid for by exports, and all the while Dutch exports of dairy produce were decreasing, no compensation could be looked for from increases in the export of manufactured articles. Rather the contrary. Dutch industry, even before the crisis years, catered mainly for the home market; and in the years that succeeded the crisis the value of Dutch exports of manufactured goods (excluding foodstuffs) fell by more than half.

The policy of the Government can be summed up as one of encouraging native industry in an endeavour to approach, though not to reach, self-sufficiency. During pre-war years the degree to which domestic industrial production satisfied the home market was continuously increasing. Since the war, it has become increasingly apparent that the ultimate solution lies in a drastic reorientation of Dutch economic life in favour of greater industrialization and an amplification of the list of available exports. To this end are needed more skilled workers, new factories, and the replacement of obsolescent machinery.

While accepting these changes as fundamental it must not be forgotten that Holland, in common with other European countries, was occupied by a hostile army, that her cities were bombed and her fields fought over and flooded. Moreover, after that she had trouble with her East Indian Colonies which stopped trade between them. By 1947 she was beginning to recover and was exporting food and machinery to Great Britain, while in the East there was the conception of a United States of Indonesia which would maintain firm trading alliances with the Mother Country. In 1948 the existing customs tariffs of the Belgium-Luxembourg Economic Union and that of the Netherlands were superseded by a joint tariff, the Benelux Customs Union Tariff.

OVERSEAS TERRITORIES OF THE NETHERLANDS

Holland's Asiatic possessions consisted of Java and Madura, Sumatra, part of Borneo, Celebes, the Molucca Islands, Timor, Bali, and Lombok (see "Southern Asia and Indonesia: The Malay Archipelago"). Since 1949, complete sovereignty has been transferred to the Republic of Indonesia except in the case of the



Netherlands New Guinea territory, which remains a subject of dispute. The total area involved in this transfer was approximately 735,000 square miles, and the population over 78,000,000.

In America the Dutch West Indies (see

"West Indies") include Surinam or Dutch Guiana, capital at Paramaribo, area 54,300 square miles, population 221,000; and the island group of Curaçao, or Netherlands Antilles, governed from Willemstad, area 366 square miles, population 169,000.

Belgium

THE Belgians are an industrious people, whose misfortune it is to inhabit a battlefield. Their small country, in the north-west of Europe, is, it would be almost true to say, a territory which has been deliberately set apart by the great European Powers to be so used.

Belgium is an artificial construction which owes the present delineation of its frontiers to any but geographical reasons. These frontiers are, for so small a state, both extensive and various: that with the sea being about forty-five miles in length, with Holland 269 miles, with Germany sixty-two miles, with the Duchy of Luxembourg eighty-one miles, and with France 384 miles. The very names of the Belgian provinces are an indication of the arbitrary character of the Belgian frontiers. Belgium has a Flanders, but so have France and Holland. Belgian Luxembourg has its parallel in the Grand Duchy. Hainaut and Lorraine have their homonyms in France. Limbourg and Brabant are the names of Dutch as well as of Belgian provinces. The Kingdom of the Belgians possesses nevertheless, as will be made clear, a unity of its own; which despite the somewhat artificial nature of its boundaries, despite its regionalism, and despite its two races and two languages, has existed for centuries and is stronger to-day, after more than a hundred years of independent national existence, than it has ever been in the past.

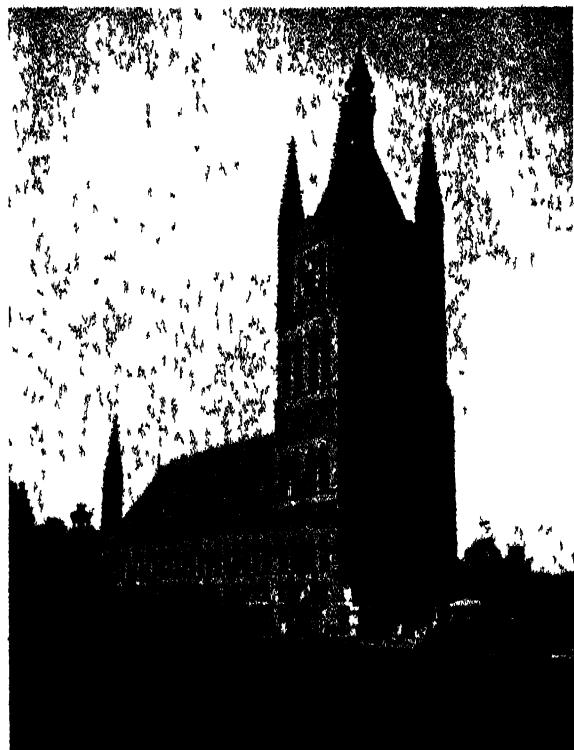
Importance of Position. Belgium has, from the geographical point of view, a privileged position: but it is one which possesses, to no small degree, the defects of its qualities. These qualities arise in part from the country's mineral wealth, but mainly from the fact that through its territories run great lines of communication that connect the three largest of the western European states—Great Britain, France and Germany.

This unparalleled geographical situation,

with all the advantages which follow from it in times of peace, is also the reason why Belgium has been more continuously involved than any other European country in the great wars of the continent. From the time of the prehistoric migrations down to the twentieth century, all the armies of history have marched over the Belgian roads and left their marks upon the face of the land: the tribes of Gaul, the Roman legions and the Germanic hordes; the Franks and the Normans; the Spanish and Italian troops of the Duke of Alva and the Dutch of William the Silent; French armies from the age of Louis XIV to that of Napoleon; the English of Marlborough and Wellington; Russians under Alexander I; the Germans of Blücher, William II and Hitler. The names of small towns and of humble Belgian villages—Herstal, Malplaquet, Neerwinden, Fleurus, Jemappes, Waterloo, Ypres, Zeebrugge—form almost a pattern of European history.

Though Belgium is one of the more recent of European states, the separate historical existence of the Belgian people has been a reality for many hundreds of years. During the reigns of their earliest princes (of whom some, like Godfrey de Bouillon, the first king of Jerusalem, and Baudouin de Hainaut, the first Latin Emperor of Constantinople, were of European fame) the dukedoms and counties of Belgium began to achieve a feeling of mutual relatedness, and in the fifteenth century they were gradually united, through marriage, inheritance, or purchase, by the House of Burgundy. It was during the Burgundian period that Belgium first became a great commercial, industrial and artistic centre.

The Cause of National Unity. The most illustrious of the descendants of the House of Burgundy was Charles V, born at Gand, an Emperor of Germany and King of Spain. Upon his abdication the Belgian provinces became a part of the family estate of the rulers



THE CLOTH HALL, YPRES

The building has been restored as far as is intended. The ruins to the right will remain as a memorial of the first World War; the ground floor is now a market, the first floor a museum.

Photo: Central

of Spain, who as absentee landlords governed this northern possession through deputies. Upon the extinction of the older line, their Belgian territories were inherited by the Austrian Hapsburgs. It must not be thought that the Belgians at this time, or before, felt themselves to be under alien domination. They were governed by their own Dukes of Brabant who were, it is true, at the same time Kings of Spain or Emperors of Austria. But it was to the Duke, not to the King or to the Emperor, that their allegiance was due and was paid. This point, which we may seem to have overstressed, has its importance nevertheless, because it is the explanation of the growth and persistence of the idea of Belgian nationality and nationhood through long centuries of subjection to absentee rulers.

How has the idea of nationality been able to arise, to grow and to survive in a country which has no geographical unity, no natural frontiers, and no racial homogeneity? Perhaps because the Belgians are, more than others, a nation based upon their history and upon the traditions and moral coherence that have grown

out of that history. The Belgian character has always been regionalist, and the culture of the people municipal and not feudal. One of the most tangible marks of the existence of their municipal spirit is to be found in the Belgian "*amour du clocher*"—the love of a self-governing people for the democratic liberties of their communes. These local rights and privileges, often hard-won and always energetically maintained, are reflected in the architectural masterpieces of the Belgian cities, in the Gothic town halls and in the majestic buildings, raised by the guilds and corporations, that flank the great squares of Bruxelles, Louvain, Anvers, and so many other of the great towns.

Boundaries and Scenery. The country itself has, very roughly, the shape of a right-angled triangle. The hypotenuse or longest side runs, in a north-west to south-east direction, from the North Sea to the Grand Duchy of Luxembourg, lies approximately along the line of the French frontier, and is crossed by the Schelde (Escaut), Sambre and Meuse Rivers. Contained within the right-angle is the Campine or Kempenland; and stretching from it are the other two sides of the triangle: the longer side, with an east-west direction, skirting the Dutch frontier and meeting the North Sea near the Schelde estuary; the shorter side, with a north-south direction, crossed and re-crossed by the German frontier, and extending down to the province of Luxembourg and the Grand Duchy.

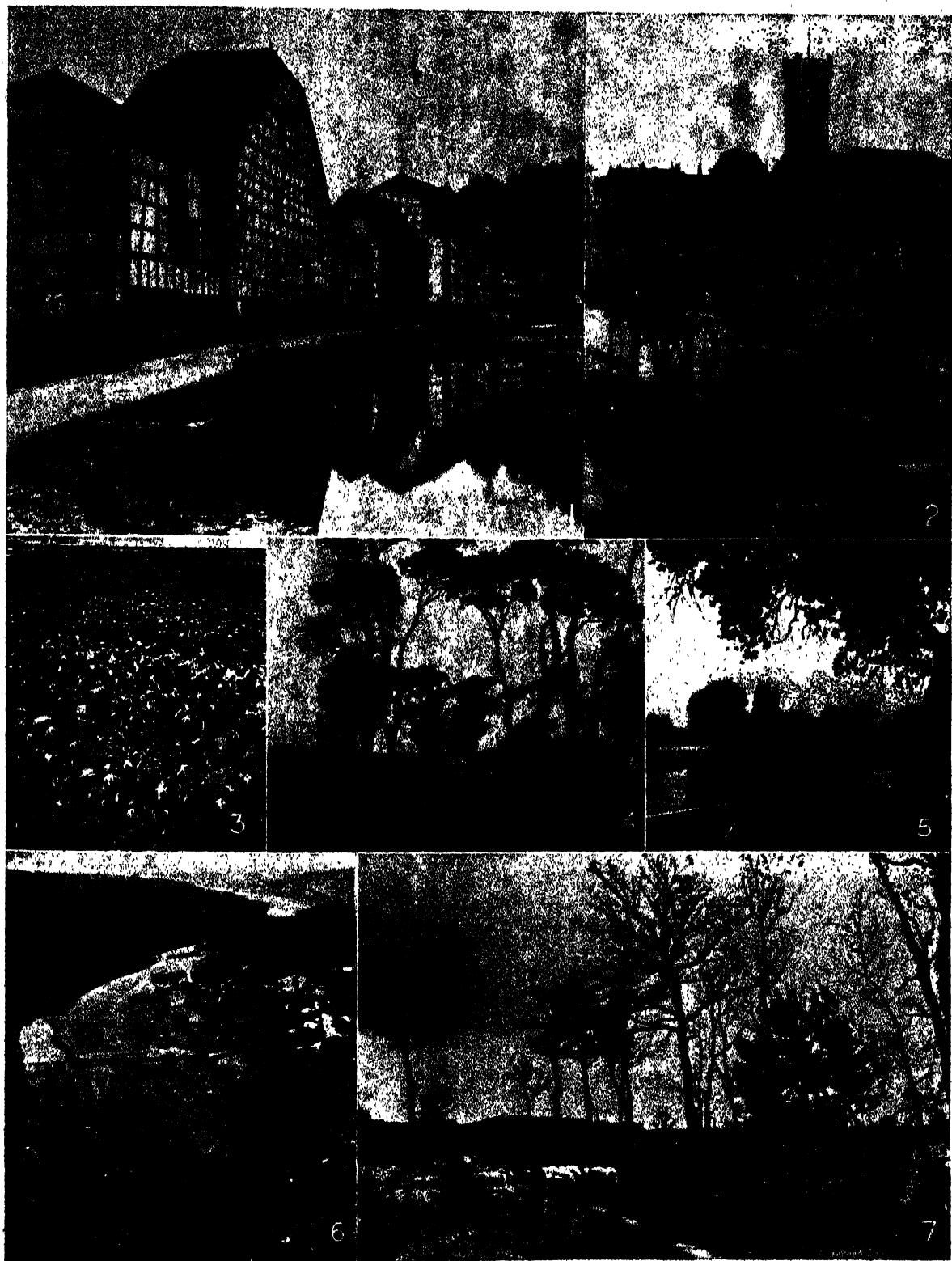
The level of the ground rises progressively as we travel from west to east, from the sea and the Flanders plain to the middle Belgian plateau of Brabant and Hainaut, and so to the high Ardennes country lying south and



A CANAL IN BRUGES (BRUGES)

A network of such waterways flows through the city

Photo: Schofield



THE BELGIAN LANDSCAPE

1. Tanneries at Stavelot.
2. Harbour and Clock Tower, Ostend.
3. Tulip field at Santvliet.
4. Road between Brugge and Ostend.
5. Confluence of the Ourthe and the Meuse.
6. Valley at Frahan.
7. Typical country

Photos: *Sergyski, C.E.P., Courtesy Belgian Railways and Marine; Keystone; Wide World; Fox*

east of the Meuse. The Meuse, flowing down from the Ardennes, is the river of French-speaking Belgium, as the Schelde, flowing more sluggishly through the coastal lowlands, is the river of the Flemish-speaking part.

The Ardennes district is not simply to be described as a hill country—it is a high plateau broken up by the deep gorges cut by the rivers that flow through it. Originally forest land, it is to-day slowly changing into a region of animal husbandry, although the characteristic life of the timber-belt to a large degree still persists. The villages lying in the

living is to be wrung out of this soil. Urbanization is slight, and the comparatively isolated villages, with their few, small and dismal-looking houses, usually built of slate, present a forbidding appearance quite in harmony with the gloomy landscape. The more obvious beauties of the Ardennes countryside must be sought in the deep and twisting river valleys. A love of the desolate upland moors is acquired only slowly and by a few.

Between Liège and Namur, and south of the Meuse, are the hills of the Condroz; while west of the Meuse (above Namur) and south



NAMUR
Le pont de Jambes
Photo: Belgian Railways and Marine

sheltered valleys are small, few of them having a population of more than three hundred. Although it has always been a land of peasant proprietors and of small farmsteads, the inheritance laws that provide for a division of the family property between all the sons, and the high birth rate, are between them leading to a steady decrease in the average size of holdings.

This situation is to some extent relieved by the emigration of peasants to the factories of the Meuse, but principally by the more intensive methods of agriculture which are more and more used. Artificial fertilizers, now often bought co-operatively by the villages, and collective schemes for the marketing of their produce, have transformed the old subsistence agriculture of the Ardennes; and the district, though its density of population remains low compared with that of the country as a whole, is becoming able to maintain larger numbers. The standard of living is low. Agriculture is a pursuit that must be obstinately followed if a

of the Sambre is the area known as "*l'entre Sambre-et-Meuse*." It is through these two regions (the former one of hills and valleys for the most part running parallel to the river; the latter having a similar but less regular ridge-and-valley structure, sometimes intersected by transverse valleys), that we descend from the plateau towards the lowland plain. The Valleys of the Sambre and the Meuse, up to where the Meuse leaves Belgium to enter Holland, run almost centrally through this middle plateau. Beyond, in the west, are Hainaut and Brabant, and the maritime plain through which flow the Schelde and its tributary the Lys; in the east the slight uplands of the Campine stretch out a finger towards the Dutch delta province of Zeeland.

Belgium's "Black Country." The Valleys of the Sambre and the Meuse, before the latter river turns northwards to Holland, constitute a broad and highly industrialized strip of territory that lies from east to west across the country extending from frontier to frontier.

The Belgian coal-fields, themselves a continuation of the French, stretch from Mons to Charleroi, and are then continued in a thin and unproductive belt along the valleys until, at Liège, the deposits become more plentiful and are again exploited. From Mons in the west to Verviers in the east the landscape is one of factories and chimneys, of slag heaps and canals, of the massed houses of Belgium's industrial workers. Two million people, a quarter of the country's population, live in this Black Country.

The industrial tradition here is an old one, and mention of Belgium's iron manufactures can be found in texts of the tenth century. Originally developed more to the south, on the lower levels of the Ardennes and in the shade of the great forests, it has moved down to the river valleys; and since the Industrial Revolution has become concentrated around Mons, Charleroi and Liège. Coal is the base of this industrial region, and iron and steel the largest industry; but glass, engineering and chemical works are almost as important, while Liège, in addition to its heavy industries, is becoming more and more a centre for light industries such as paper, rubber, motors,



SAND DUNES AT LA PANNE

Photo - Belgian Railways and Marine

cycles, and crystal ware. At the extreme eastern end of this industrialized belt is the town of Verviers, still the centre of Belgium's woollen and textile industry.

Farther north extend the plains of Hainaut and Brabant, gently rising from the west to the east.

Here, on a clay, sand and chalk subsoil, is a surface soil of loam, which is eminently suitable for arable farming. It is a country of well-to-do farmers, for the average size of holdings is quite large (from fifty to one hundred hectares).

Apart from the urban agglomeration of Bruxelles, which was the former capital of the Dukes of Brabant and is the present capital of Belgium, the central plain has an essentially rural character. Its few towns are of declining importance, and are to-day hardly more than agricultural marketing centres. Louvain, still famous for its university, typifies this process of economic decline.

Agriculture. Though rural, the density of population of these provinces is very high. Agriculture has become an industry, and every farm a well-equipped factory. The breeding of horses for farm work is important in the district surrounding the capital, but the typical agriculture of Brabant and Hainaut is the raising of cereal crops (particularly wheat) and the cultivation of the sugar beet. Farming is further diversified by the presence, in addition to these staples, of fruit orchards and market gardens.

The aspect of the almost treeless plain, its uniformity deepened by the unending sameness of the hedgeless fields and by the ever-recurring and closely-set white farmhouses, is one of monotony, broken only by the low valleys



hollowed out by northward-flowing rivers on their way to swell the slow current of the Schelde.

In the north-east of Belgium is the still largely uncultivated Campine, a great waste of sand and gravel heathland, stretching away across the frontier into the Netherlands. Here, particularly in the western part, nearest to Anvers, land reclamation is going on. Pine trees are being planted, the soil refreshed with

1500 to 3000 feet) but are of great importance. Reserves are estimated at 8,000,000 tons.

Flanders. The last region of Belgium that we have to describe is Flanders, consisting of two clearly-marked areas: the maritime plain, flat, with a clayey soil, and possessing almost no trees; and the hilly and sandy interior plain. In the first, where the ground is astonishingly fertile, fairly large farms of from twenty-five to fifty hectares are the rule. In the second the land seems to have been almost infinitely subdivided. The agriculture of the two provinces is highly specialized and diverse. Flax is still cultivated, though not as much as formerly, in the district round Courtrai; hops are grown in the region around Alost and Poperinghe; Gand is surrounded by flower gardens; industrial crops such as sugar beet, chicory and tobacco are widely raised; root crops and clover are grown as cattle-feed; and there is a diminishing but still large area under cereals.

An interesting feature of Flanders life is the almost total absence of villages. The houses of the farmers and peasants are built among the fields in which they work, and the borders of trees that mark the limits of the small holdings present a curiously forest-like appearance to the view. The man-made fertility of the south Flemish plain supports a densely-packed and evenly-spread rural population which, however, here and there, especially along the banks of the Lys and Schelde Rivers, is interrupted by great textile and commercial cities.

In the extreme north-west we find Belgium's forty-five odd miles of sea coast, low-lying polders fringed by dunes and pleasant sandy beaches. Here the pleasure resorts—Ostende, Blankenberge, le Zoute, Westende, La Panne and many others—provide an agreeable contrast to the busy farms and factories of the rest of the country, and offer relaxation to holiday-making Belgian and to tourist alike.

The Cities. With the exception of Bruxelles, whose situation from a geographical point of view is somewhat arbitrary, the cities are concentrated along two belts: the Sambre-Meuse Valleys, and the Valleys of the Lys and the Schelde. Bruxelles itself, historic, old and beautiful, is not only the political but also the artistic and intellectual capital of the country. Though a bilingual city, it is in character more French than Flemish. Its cathedral of Sainte Gudule, its fine civic buildings, its magnificently situated Palais de Justice and the



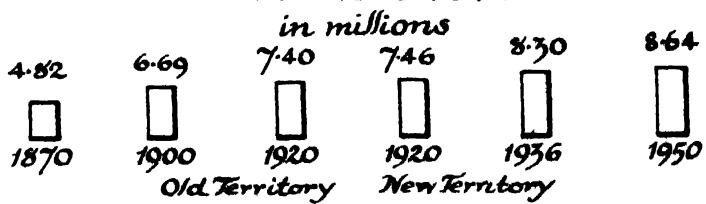
A STREET IN GAND
Photo Belgian Railways and Marine

heavy manuring and irrigated with water brought by canal from the Meuse. The cultivated area is, for the most part, subdivided into small holdings of from six to seven hectares. In the west of the Campine the commonest crops are rye, oats, and various kinds of fodder; in the east, which has recently seen the growth of an extensive co-operative movement, dairy farming is the main activity, and the province of Limbourg must now be numbered among Belgium's largest butter-producing districts.

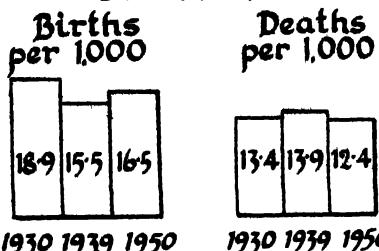
During the first World War the exploitation of the Campine's coal measures was begun, the first pits being sunk at Winterslag in 1917. These deposits are at considerable depth (from

BELGIUM

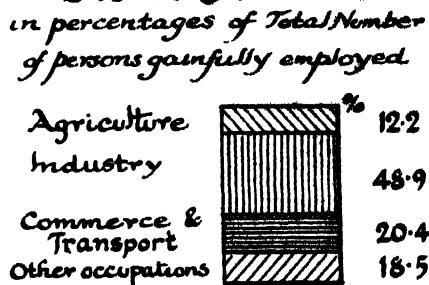
POPULATION



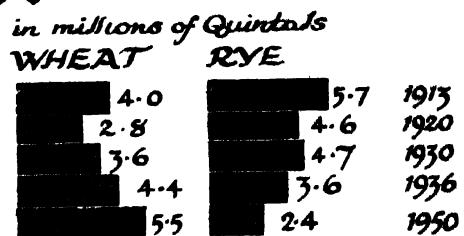
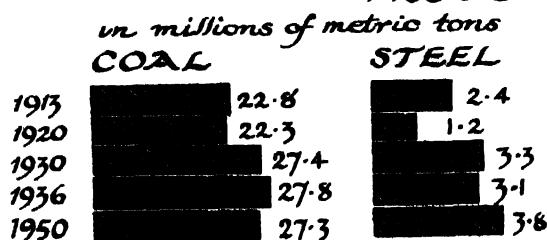
VITAL STATISTICS



OCCUPATIONAL DISTRIBUTION

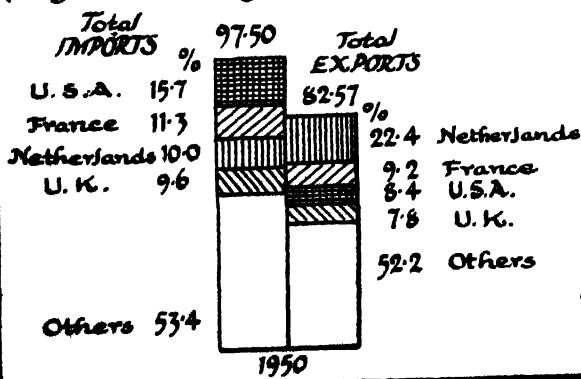


PRODUCTION



IMPORTS & EXPORTS

Foreign Trade by Countries in thousands of millions of Francs
(Belgo-Luxemburg Economic Union)

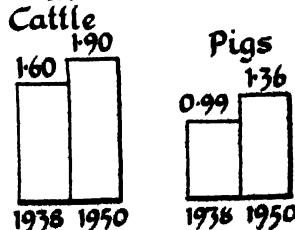


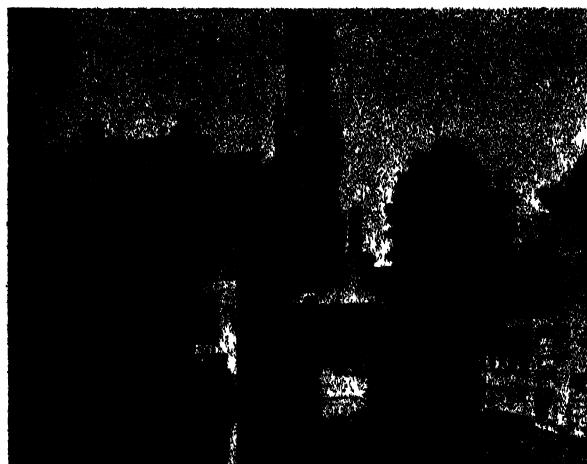
NATIONAL INCOME 1950

in millions of Belgian Francs

265,000

LIVESTOCK in millions





BRUGGE
Canal at Quai de Rosaire
Photo: Topical

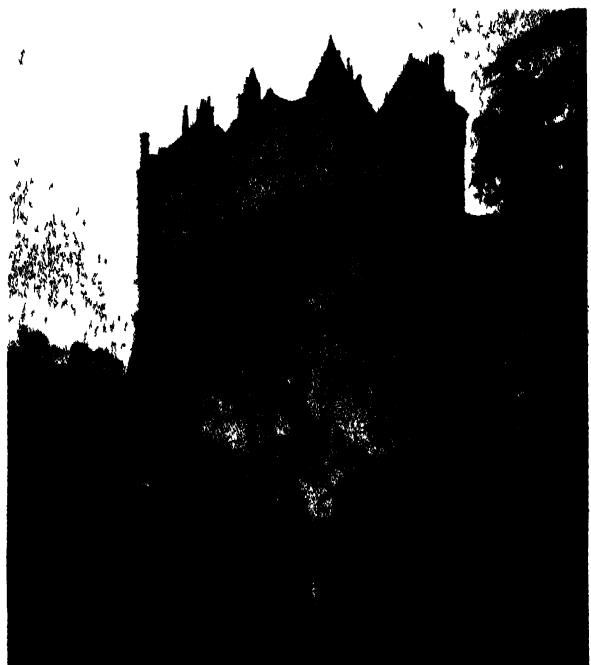
picturesque Bois de Cambres with its islands and lakes, make it an impressive metropolis. In addition to the administrative, commercial, and banking activities of the city, a large number of industries have grown up in the spreading suburbs, obtaining their coal by way of the Bruxelles-Charleroi canal. Population, 966,482 (1950).

Gand. This largest of the Flemish towns, is well-placed at the junction of the Lys and the Schelde. The arms of the rivers which penetrate it, as well as the canals with which it is intersected, give it an almost Dutch appearance. Here we can find an old city joined with a new. The new city, lying to the east of the old, is in the main a nineteenth century growth, and the population, since 1800, has increased from 55,000 to 166,000. Its prosperity is based to-day, as in the past, upon textiles. Two-thirds of the spindles of Belgium's linen industry are at Gand; the cotton industry accounts for over half the total spindles and looms in the country; and recently both jute and hemp have begun to play a part in the city's textile industry. Population, 166,170 (1950).

Anvers. Situated near the mouth of the Schelde, it is to-day Belgium's greatest port, dealing with four-fifths of her sea-borne trade. Early in the fourteenth century its fairs were visited by German and Venetian traders, but the town's rise to commercial greatness, at the expense of its rival Bruges, was due to its selection by the English Merchant Adventurers as a base for their trade with the Continent. By 1550 there were more than 20,000 people in Anvers who lived from this English trade.

The example of the Merchant Adventurers was followed by the Hanseatic League in 1545, and the Portuguese spice ships were now also appearing regularly in the port. After the sixteenth century, decline set in. The Schelde was closed by the Dutch from the Peace of Westphalia in 1648 until the armies of the French Revolution re-opened the river in 1793. The port then began to regain its traffic. Docks and quaysides were rebuilt and extended, and a new city grew up around the harbour. These vicissitudes are well reflected in the ground-plan of the present city. The boulevards that surround the old town follow the line of the walls of 1543, now pulled down. To the east is the new town, its boundaries marked in 1859. Beyond again, is the outer zone of suburbs, of almost contemporary growth. Population, 261,400 (1950).

Other Cities. *Brügge*, traversed by a network of canals crossed by fifty bridges, makes lace, textiles, and tobacco, and has shipbuilding yards, breweries, and distilleries. *Liège*, an iron and armament-making centre having also zinc foundries and car factories, is on the Meuse in the east Belgian coal region (156,200). *Malines*, the religious metropolis of Flanders, makes felt and straw hats, woollen goods, tapestries, furniture, carpets, and large bells (61,400). *Namur* is an industrial centre at

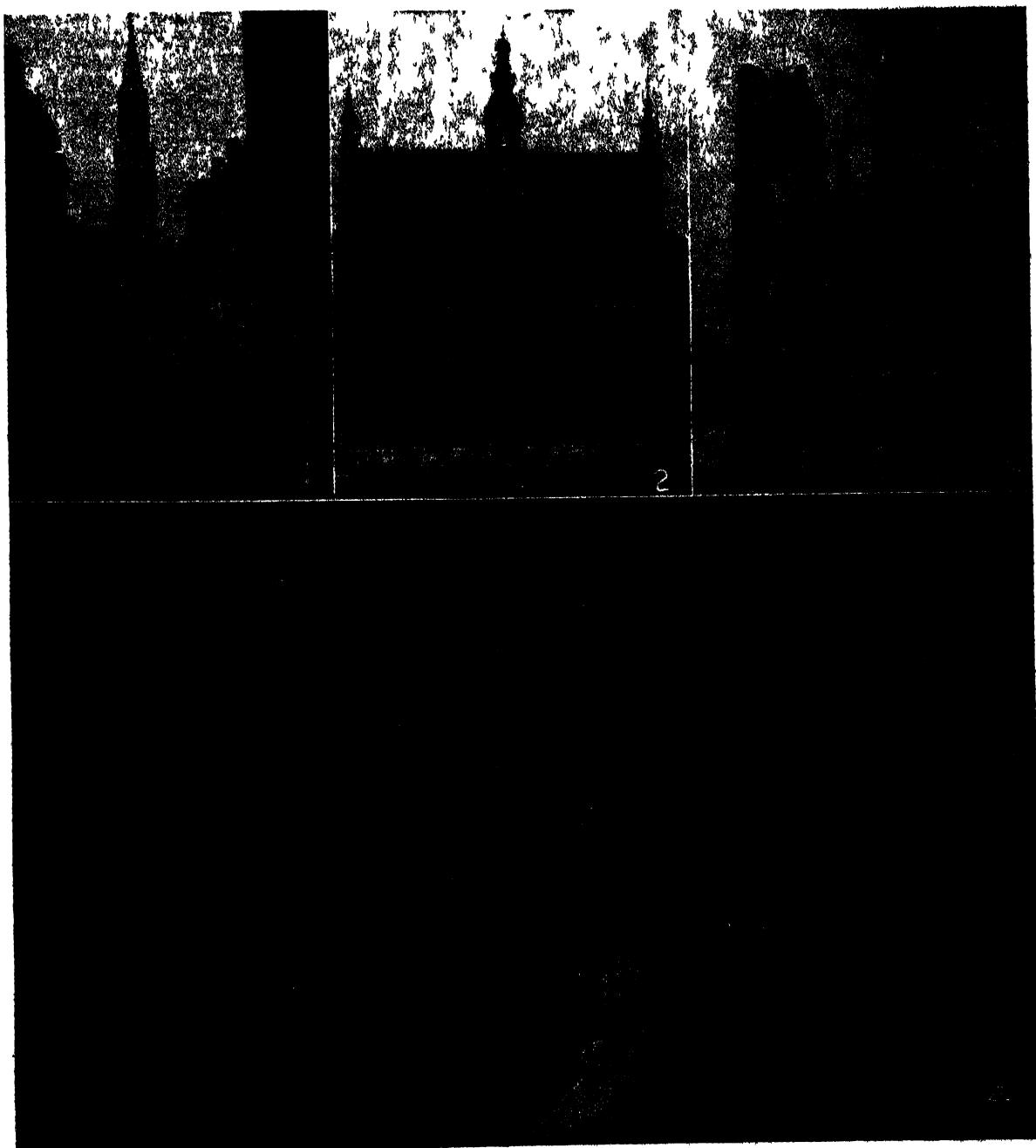


CHATEAU DE WALZIN
A castle on the River Lesse, in the Ardennes
Photo: Schofield

the confluence of Sambre and Meuse (31,200). Ostend is a fishing port and holiday centre (50,900).

The People. Many people are surprised to discover that Belgium is inhabited by two races, the Walloons and the Flemings, each for the most part speaking its own language.

The Walloons predominate in the more southerly part of the country, in the provinces of Hainaut, Namur, Liège, and Luxembourg. They share the province of Brabant with the Flemings (Walloons in the south and Flemings in the north). The coastal plain, the provinces of East and West Flanders, Anvers



BRUXELLES

1. A street near the Town Hall, the tower of which is in the background. 2. Maison du Roi, thus was the ancient Bread Hall in the time of Charles V. 3. Sante-Gudule Cathedral. 4. A general view of the city

Photos. Keystone, Fox



PEOPLE OF BELGIUM

1. Carnival at Dinant, showing the "Gilles" of Binche. 2. Street musician in Bruxelles. 3. Binding flax in Courtrai.
4. Shrimp fishers at Coxyde

Photos: Sergysels, Courtesy Belgian Railways and Marine; Planet; Keystone

and Limbourg, and a part of Brabant, are Flemish-speaking.

What is surprising in all this is not the juxtaposition of two races and of two languages. Such a phenomenon is common enough. But while, in Switzerland for example, some natural frontier, some mountain range, delimits the different linguistic regions, this is not so in Belgium. No natural boundary or accident of geography separates the Walloon from the Fleming. The line of demarcation that exists, and which has shown an extraordinary stability over a period of centuries, follows an almost straight course from Lille in France to Aachen in Germany. Only in the region of Bruxelles do the two languages interpenetrate. Elsewhere the distinction is sharply drawn. In the small town of Renaix, for instance, one can

find Flemish almost exclusively spoken on one side of the street and French on the other. Flemish, a version of *plattdeutsch*, and intelligible to the average Dutchman across the border, has seen a renaissance since the declaration of Belgian independence in 1830, and is now one of the two official languages of the country, enjoying an equal status with French.

The differences that exist between the Walloons and the Flemings seem to the foreigner very great, and a superficial observer might even come to the conclusion that they are sufficiently far-reaching to constitute an actual incompatibility between the two races. The Flemings, long-headed, tall, heavily-built, silent, turned very much in upon themselves, obstinate and dour, contrast very sharply with the round-headed, small and stocky Walloons,

whose light-hearted seriousness and spontaneity bring them much closer to the French. Racial types, as is usually the case, do not show any exact correspondence with linguistic boundaries, and the long-headed "Nordic" is by no means as common in the Flemish part of Belgium as is the Flemish language. In the Walloon provinces the "Alpine" stock has remained rather more pure, and there has been less admixture of "Nordic" elements.

But though the one race has affinities, both in its language and character, with the Latin French, and the other with the Teutonic Germans, they share a common soil, a soil from which both have sprung. Both have the same communal traditions and love of liberty—the "*amour du clocher*" of which we have spoken above—and the jealous regionalism of Walloon and Fleming alike draws them closer together. The history which both inherit, and

the lesson of unity instilled by repeated invasions of their common fatherland, have established a firm bond between the two Belgian races.

Some indication has already been given of the nature of Belgian agricultural production, and of the localization and character of the country's industry. Though her agriculture produces, in the main, for the domestic market, she is unable to produce sufficient to feed her dense population or to supply her industrial demands. Wheat has to be imported. Only 10 per cent of the wood she uses is home grown. Native supplies of flax have to be extensively supplemented from abroad. Meat, butter, cheese and eggs are bought in large quantities from Holland.

Agricultural recovery, after the economic crisis of the 1930's, was very slow. Agricultural receipts increased, but costs of production,



ANVERS

In the foreground is the Cathedral, considered by many the most beautiful Gothic church in Belgium. The Town Hall can be seen between the Cathedral and the River Schelde

Photo Belgian Railways and Marine



GATEWAY AT AN OLD BRIDGE IN BRÜGGE
Photo: Will Rose

especially in dairy farming, increased much more than proportionately. The rise in the price of cattle foods, for example, was 20 per cent greater than the rise in the price of butter. The government, torn between pressure from the farmers, who demanded the introduction of quotas and licensing schemes, and the need for keeping the cost of living low, founded (in May, 1937) the C.O.R.A. or Commission d'Orientation Agricole to devise ways of helping Belgian agriculture.

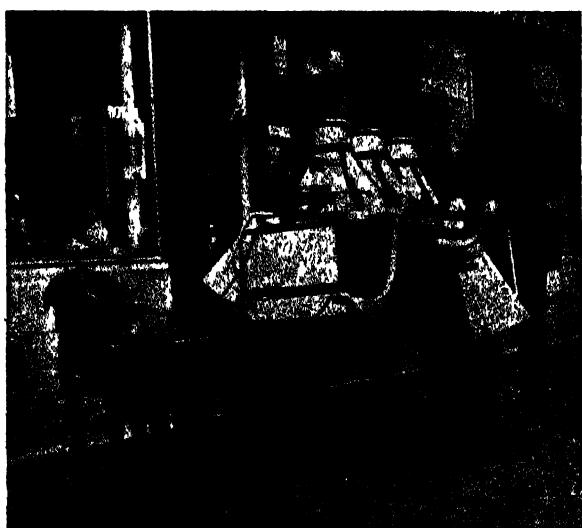
Enterprises such as this were inevitably dislocated by the 1939-45 War and the invasion of Belgium by Germany. After the war, however, the problem was tackled anew, and much progress has been made towards a more balanced agricultural economy.

Industries. Belgium is, however, an essentially industrial country, deserving to-day, perhaps as much as Great Britain, the title of "workshop of the world." She lives by her foreign trade, exporting even before the last war some 33 per cent of her industrial production (comparable figures for Great Britain are 25 per cent, for France 14 per cent). For particular Belgian industries the figures are even higher: of her output of glassware nearly all is exported; of her iron and steel products, about two-thirds; of her textiles, about half. These, with the products of her chemical industry, are Belgium's principal exports. Her most important imports are wheat and other foodstuffs, coal, and the raw materials needed by her metallurgical and textile industries.

A brief sketch-map showing the localization of Belgian industry (which would in fact be identical in shading with one depicting the densities of population) can be roughly drawn as follows: from Roulers, Courtrai and Tournai

in the west the textile country extends first to Gand, and then beyond almost as far as Anvers, a wide band from which a northward-stretching arm reaches out in the direction of Brügge and another, in a south-easterly direction, to Malines. Two other small textile areas, one round Melincourt, St. Etienne and Orbais, in the centre of the country, and the other at Verviers, south-east of Liége, complete the tally. A belt of diversified industrial activity extends around Bruxelles; and finally there is the highly industrialized Sambre-Meuse region, with its coal, iron and steel, glass and chemicals.

On a smaller scale, Belgium reproduces many of the characteristic features of the English economic structure, particularly so far as her industry is concerned. Concentrating upon bulk production rather than upon value, producing mainly semi-manufactured goods for export abroad, Belgium has made, in the industrial sphere, a startling recovery from the major effects of the war years. Before the war working conditions, moreover, had been very sensibly improved: a basic minimum wage for all adult workers was introduced; six-day annual holidays with pay were established by law; Conciliation Boards in the major industries, to deal with wages and hours, were constituted. Belgium has cause to be satisfied with the way it has rebuilt its economic position since the war and should look to the future with confidence, now that the political difficulties which resulted in the King's abdication in 1950 have been solved.



A MILKMAN OF YPRES
The use of dogs as draught animals is still found
Photo: Photopress



THE BEACH AT OSTEND
Photo Sergysels, Courtesy Belgian Railways and Marine

OVERSEAS POSSESSIONS OF BELGIUM

The Belgian Congo (see Africa: Intertropical Africa), in west-central Africa, has an area of

909,500 square miles, and a native population of 11,330,000. It now also includes Ruanda and Urundi, formerly parts of German East Africa, area 29,000 square miles.

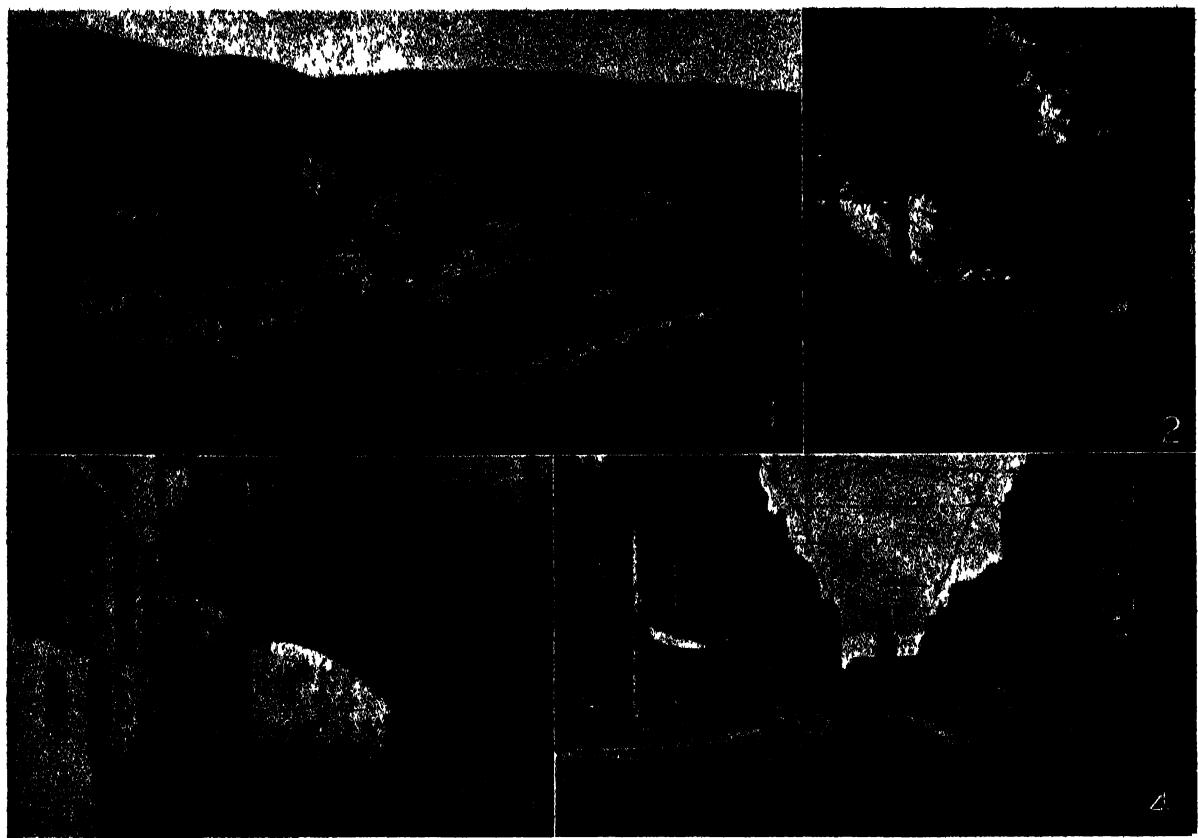
Luxembourg

LUXEMBOURG is an independent Grand Duchy in western Europe, lying in the basin of the River Moselle and bounded by Germany, Belgium and France. Its 999 square miles consist of a plateau, furrowed with valleys through which rivers and streams flow to the Moselle. In the northern half it is a continuation of the Ardennes plateau and in the southern half it is an extension of the Lorraine plateau. The main waterways are the Sauer, Alzette, Eisch and Clerf, all feeding the Moselle, which

for approximately twenty miles forms Luxembourg's eastern border.

The country is well wooded, approximately 34 per cent being given over to forestry. Nearly half the country, however, is arable. In the south are heavy deposits of minette, an iron ore, on which an important iron industry is founded. The extraction and smelting of this ore, is, next to agriculture, the principal occupation of the 298,600 inhabitants (1950 estimate).

Agriculture. Though the soil is not very



SCENES IN LUXEMBOURG

1. Kautenbach. 2. "Route Nationale," one of the main roads into Belgium. 3. An old corner of the city of Luxembourg.
4. Avenue de la Liberté in the capital

Photos: Belgian Railways and Marine; Keystones; Wide World

fertile, farming flourishes. Most of the agriculturists are peasant landowners. Seventeen per cent of the land is permanent meadow pasture, and there is an important industry in the rearing of livestock. A recent census showed 124,230 head of cattle, 119,680 pigs, 13,910 horses, 2700 sheep, and 1240 goats. Approximately 47 per cent of the arable land is under cereals, and there is a substantial output of oats, wheat, rye and barley, the importance of the crops being in that order. Milling is important and to help agriculture the Government of Luxembourg has decreed that all flour milled in the country must contain at least 65 per cent of home grown wheat and 10 per cent of home grown rye. Imported flour cannot be sold as such but must be mixed with 75 per cent of home ground flour. No miller whose production quota exceeds two per cent is allowed to grind or sell the products of food cereals. All millers having a quota are forbidden to grind pure rye flour. Flax, hemp, tobacco, and potatoes are also grown with extraordinary success. The cultivation of grapes is also

important, though the people of Luxembourg themselves are not very heavy wine drinkers.

Manufactures. The non-existence of coal in the Grand Duchy is a handicap to the iron and steel industry, but even so, the yearly output of cast iron and steel is maintained at more than three million tons. Great blast furnaces operate at Esch, Dudelange, Differdange, and Rumelange, while the capital city of Luxembourg is now mainly a manufacturing centre. Ore is sent to Belgium, with which country there is an economic union, and pig iron and steel are sent to France. Steel is exported to Great Britain in substantial quantities. Light engineering, embracing foundries, machine manufacturers and constructional work, employs a limited number of workmen.

There is a big output of manufactured articles, such as gloves, linen, paper, malt, distilled liquors, sugar, pottery and tanned leather, in which a lucrative export trade is carried on. Considerable quantities of pottery are sold to the Near East, and fancy wares to Germany. Woollen underwear and lingerie

made from artificial silk are the chief activities in textiles.

The people of Luxembourg have the advantage of dwelling in a country in which the cost of living is comparatively low. They are mostly Roman Catholics of Low German stock, and speak, in the main, a Germanic dialect called Moselfrankisch. French is the language of the educated.

The Towns. Luxembourg, the capital, has a population of 62,000 and is situated on the Alzette, a tributary of the Sauer, on a platform of rock overhanging the river, with precipitous descents on three sides. Only on the west is it connected with the neighbouring country. At one time it was a formidable fortress, and remains of the fortifications, hewn out of solid rock, can be seen in the Valleys of the Alzette and the Petrusse. One of its most interesting buildings is the Cathedral of Notre Dame, dating from the seventeenth century. A feature of the exterior is a Renaissance portal, and within there is a beautiful organ gallery of the same style. The Grand Ducal Palace, built in 1580, and enlarged in 1900, is in the Spanish Renaissance style.

Mondorf-les-Bains, eleven miles south-east

of the Grand Duchy's capital, is a well-known health resort, and is only a few miles from the Valleys of the Moselle and Sarre, celebrated for their wines and scenery. Remich, near by, and on the left bank of the Moselle, is a picturesque old town, surrounded by vineyards and flower gardens.

Diekirch, on the Sauer, is a holiday resort in the Luxembourg Ardennes. One of its churches dates from the ninth century. The old fortifications have been converted into modern boulevards. Within a few miles of Diekirch there are the waterfalls of Sasselbach, the ruins of Brandenburg and the Blees Valley.

Perhaps the most interesting and picturesque town in the Grand Duchy is Vianden: it has an interesting old castle.

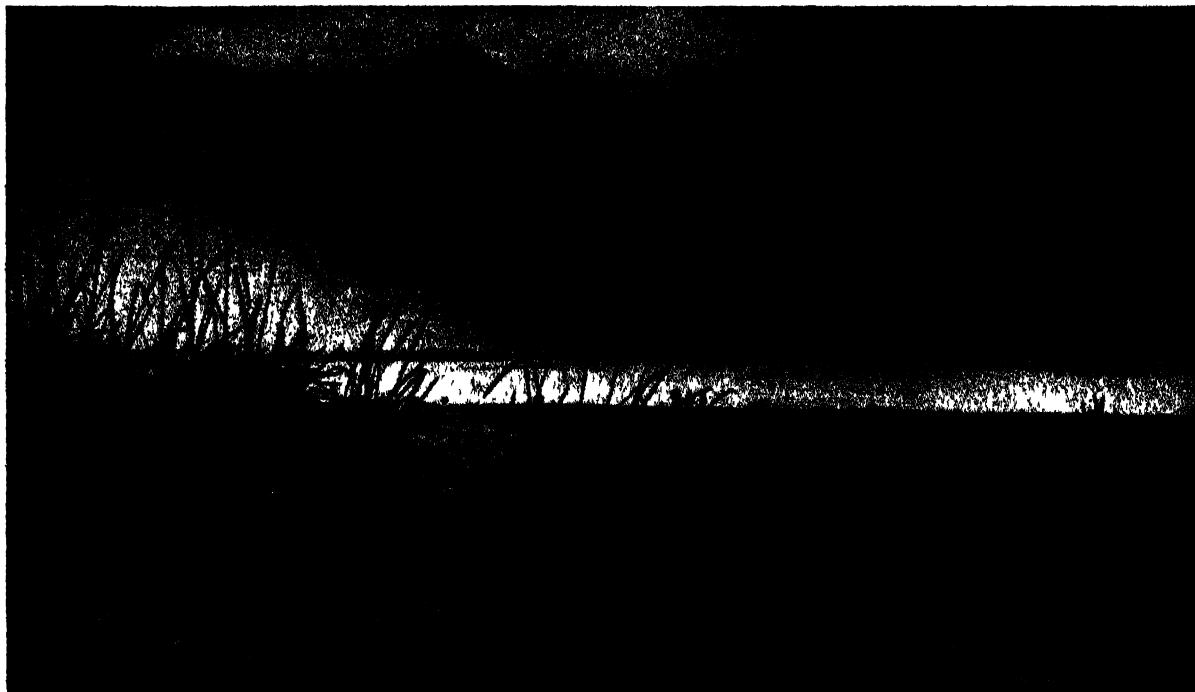
Echternach, a town of 3200 people, situated on the right bank of the Sauer, is well known for its old ramparts, double-towered basilica and abbey, and a Town Hall dating from 1530. The Benedictine Abbey Church, founded in the eleventh century, is said to be one of the most perfect Roman basilicas in western Europe. Echternach is famous for its "dancing procession" in which about 15,000 people take part every Whit-Tuesday.



GENERAL VIEW OF CLERVAUX
A town in the north of the Duchy of Luxembourg
Photo: Belgian Railways and Marine

SCANDINAVIA

(Denmark, Norway, Sweden, Iceland and the Faeroe Islands)



THE COAST OF DENMARK

Sand-dunes border the coast for miles on end, producing the typical vegetation shown

Photo: Danish Tourist Bureau

Denmark

DENMARK consists of a small peninsula and islands placed between England, the lower portion of Sweden, and the entrance to the Baltic. Its area is only 16,576 square miles or almost exactly a third of that of England. Its total population was 4,200,000 (estimated) in 1950 (4,045,232, census of 1945), of which 974,900 (927,400 census of 1945) people live in Kjöbenhavn (Copenhagen) and its suburbs. Aarhus, the next largest town, has a population of 116,200, while that of Odense numbers 100,900. These are the only towns exceeding 100,000.

Far too little is known in England of the

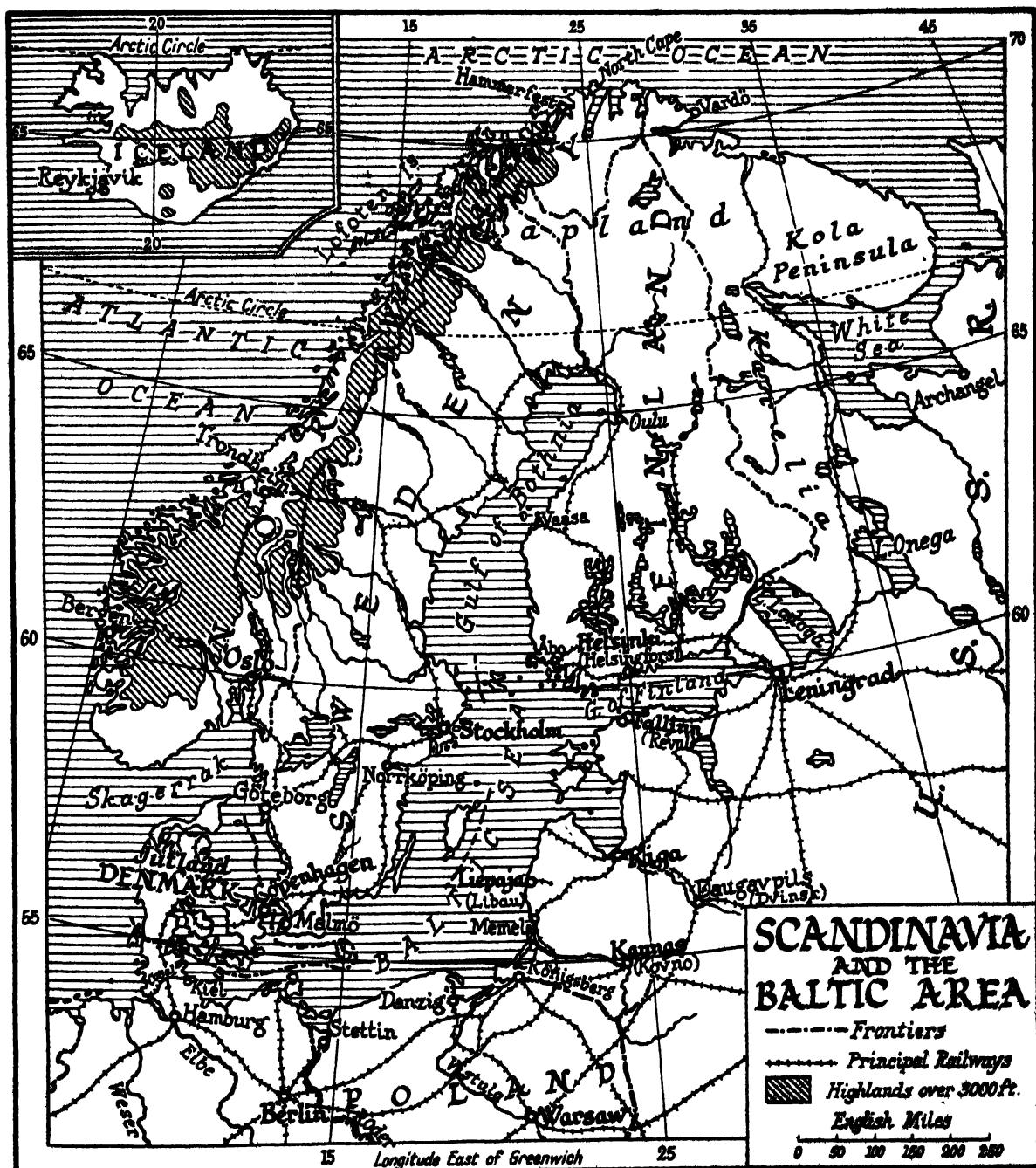
charm of the scenery of Denmark, which, while possessing characteristics entirely its own, yet, in many places, reminds one inevitably of that found in some of the English counties. It is true that Denmark possesses no mountains, and few hills. The highest, the famous Himmelberg, or "Heaven's Mount," above the shore of one of the lovely Silkeborg lakes in Jutland, attains an altitude of only 550 feet.

Denmark consists of the peninsula of Jutland, the islands of Fünen (Fyn), Falster and Bornholm—the last in the Baltic—and numerous other small islands and countless islets. One

of the chief characteristics of Jutland is its flatness, another is its wonderful sandy beaches. There are, too, beautiful and fjord-like inlets of the sea along its north-western coastline, and also in the vicinity of Aarlborg, the fourth largest town and the largest port after Kjöbenhavn and Nykjobing.

It is in this portion of Denmark that the

work of reclamation of waste land, and stretches of the countryside that have been for centuries covered by sand, has been so successfully carried out. Heathland, and patches of peat bog have also been brought under cultivation. Here and there in the setting of the flat landscape one sees an ancient windmill, silhouetted against the cloudy sky, across which



ALTERNATIVE PLACE NAME SPELLINGS
Copenhagen = Kjöbenhavn; Warsaw = Warszawa

in summer, great masses of white cloud, like argosies, float in the breeze. There are many lonely farms dotted about, the homes of small farmers for generations past, which, with the additional small houses that have gathered around the main building for the accommodation of their sons and daughters and their families, have the appearance at a distance of small hamlets.

Southward from Aarhus appear some beautiful beechwoods, larch forests, green fields, bright clear streams, and a more undulating countryside, with here and there low ridges of hills.

"The Garden of Denmark." The middle island of the Danish kingdom is Fünen, having an area of 1133 square miles and separated from the mainland of Jutland by the waters of the Little Belt, now, however, spanned by a fine bridge. Fünen is much more fertile than Jutland, and has, in fact, been named "The Garden of Denmark." It is very highly cultivated, and its scenery rather reminds one of parts of Kent and Surrey, with smiling corn-fields, orchards, tiny pools, and many flourishing and well-kept farmsteads, and with just

something different from that to which one has become accustomed to attract attention. It is a district of beech woods, and wild flowers are more abundant here than in many other parts of Denmark. On Fünen one finds several typically Danish towns.

Faaborg, in the south-western corner of the island, provides quite different scenery from that of the centre and northern portions. Here one sees great stretches of moorland, in summer purple with heather; and in the neighbourhood is the Ssvanninge Berg, the most striking and picturesque hill country in Denmark. Indeed, the charms of this district have brought into being a school of painters who have made Faaborg their headquarters. Yet another typical feature of Danish landscape in Fünen, and in the neighbouring island of Zealand, are the beautifully situated manor houses, many of which date from the sixteenth and seventeenth centuries, in the Renaissance style of architecture.

Zealand, Largest of the Islands. Zealand, the largest of the Danish islands, on which stands Kjöbenhavn, has also its delightful rural landscape comprising woodlands, lakes, the



THE DANISH LANDSCAPE

Fertile country in which ploughed fields alternate with pasture, a scene reminiscent of East Anglia with its old windmill and village half hidden by trees

Photo: Jonais Co.



KRONBORG CASTLE

The castle traditionally associated with the tragedy which Shakespeare immortalized in *Hamlet*
Photo Danish Tourist Bureau

striking scenery of the beautiful and historic Sound, which divides Denmark from Sweden, and the fjord-like inlets of the sea. The kind of landscape, indeed, beloved by artists, with fine cloud effects, and possessing much attraction for tourists and holiday-makers. The island is noted for its fine bathing beaches, and the picturesque and pleasant resorts which border the Sound, some of which are encircled by trees which come down to the water's edge. Not far from Kjobenhavn are two great Palaces; Frederiksborg Castle, and the Palace of Fredensborg, the latter situated amid some of the loveliest of Zealand scenery. Also but a few miles from Kjobenhavn stands the historic Castle of Kronborg, or Elsinore, in reality a remarkably fine Renaissance chateau, in ancient times the guardian of the entrance to the Sound, where Shakespeare laid the scene of his play *Hamlet, Prince of Denmark*.

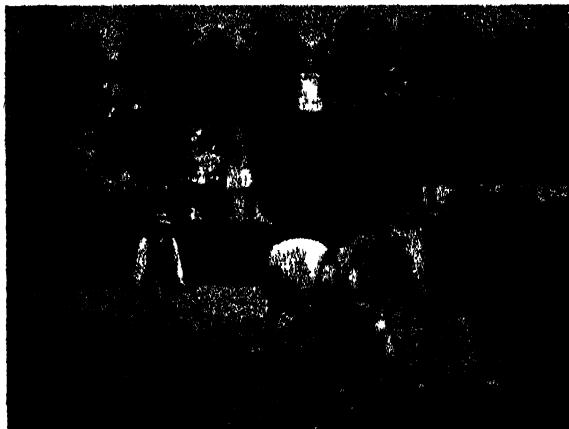
An Agricultural Country. It is a well-known fact that Denmark's chief industrial interest is farming, and that it is this which has made her famous for the scientific methods pursued, and the amazing results obtained; often, too, under very unfavourable initial conditions of the soil. Fünen is largely given over to dairy farming, bacon production, and to immense poultry farms, some of which will produce a million eggs per annum. The amazing success which has marked Danish farming is due to the fact that the Dane takes his farming seriously, is frugal, a hard worker and applies science and organization to his work, and is well-supported by the Government through the medium of Agricultural

Colleges and Agricultural-Chemical Laboratories. These factors have brought prosperity to the countryside, and the conditions of labour and remuneration are generally satisfactory. The amazing number of small farms is a proof of this, and the country people, as a whole, are happy and prosperous. The farmsteads are well-built, and, if old, are well-maintained.

It is hardly surprising that some four-fifths of the exports from Denmark are agricultural products including, of course, bacon, eggs, butter and cheese. Regarding the latter it may be added that of recent years the Danes have produced excellent native gorgonzola, gruyère, and similar cheeses. Denmark possesses over 3,000,000 head of cattle, in almost equal proportions black and white, and red.

Co-operation in farming has been brought to a high state of perfection, and the co-operative dairies, slaughter houses, and egg "factories" are under rigid Government and hygienic control. There is, too, co-operative transport, which cuts down overhead charges in dealing with the marketing of agricultural produce of all kinds. There are over 1500 co-operative stores; with a membership of at least one in ten of the population. The vast and complicated machinery of all this co-operation is in the hands of a single body, the Co-operative Executive Committee of Denmark, which, in the past, fought a successful campaign against trusts.

Mining and Manufactures. Denmark is not, except in a limited and specialized sense, an industrial and manufacturing country. For



A RURAL SCENE

The horse plough is still used and thatched cottages are numerous
Photo Clive Holland

one reason it possesses practically no natural mineral resources, with the following exceptions from Greenland, now integrated with Denmark, of some inferior coal, small quantities of iron of a meteoric origin, graphite, copper, and cryolite, essential in the smelting of aluminium and obtainable only from Greenland.

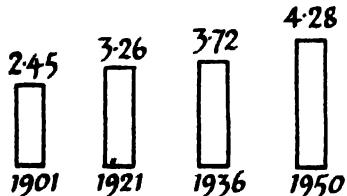
There are certain manufactories and indus-

tries in the capital and a few of the larger towns. These include shipbuilding, brewing, several branches of engineering—Denmark is the home of the Diesel marine and other engines—electrical goods, building (greatly increased of recent years), textiles (to a small extent), china and earthenware (the products of the Royal Copenhagen Porcelain works are world-famous), glass, and also silver ware. To the porcelain and silverware industries the Danes have applied art with the most beautiful effect. There is also a considerable amount of hand weaving done; the school at Sønderborg is the largest in Scandinavia. The knitwear of the Faeroes (Faeroe Islands) is also well-known for its excellence. In Denmark itself there is a considerable manufacture of furniture, and the making of machine-woven carpets has made considerable progress in recent times. But notwithstanding these industries, Denmark remains outstandingly an agricultural and food producing country.

Communications. In the matter of internal communications the country is well-served, the railways being supplemented by well-organized motor services and transport. The through express trains to Kjöbenhavn from

DENMARK

POPULATION in millions

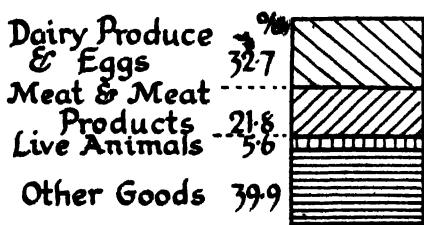


Occupational Distribution in percentages of total number of persons gainfully employed

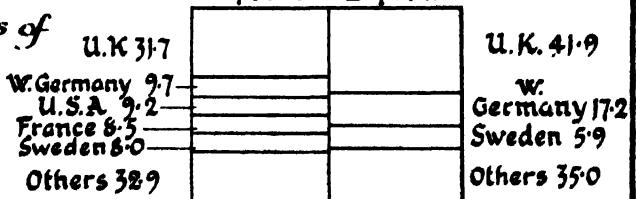


IMPORTS & EXPORTS

Principal Exports in percentages of Total Exports in 1950



By Countries in 1950 Imports Exports



In percentages of
Totals 5897 million & 4579 million
Kroner.

Esbjerg, an important port of entry for tourist and other traffic, and to towns on the direct line to the capital, give a good service which was considerably speeded up by the construction of the very fine bridge over the Little Belt linking up Fredericia on Jutland and Middelfart on Fünen, opened on 14th May, 1935. The same may be said of the "lightning" trains from Kjöbenhavn to the chief towns in Zealand and Fünen, and the non-stop expresses to towns in northern Jutland as far as Aarlborg. The construction of the wonderful Storstrombroen (Storstrom Bridge), connecting the island of Falster with that of Zealand, and thus doing away with the former train ferry, has speeded up the railway communications with Germany and the Continent. This is the longest overseas bridge in the world; the actual length being two miles, with an embankment a further quarter of a mile.

The life of the country people gives one the impression of being more serious and definitely more strenuous as a whole than it is in England. Work is commenced earlier in the day, and continued for longer periods. The present writer has seen farmers and their labourers at work in the fields before five in the morning,



A VILLAGE OF THE DANISH COUNTRYSIDE

Photo. Clive Holland

and continuing until dusk, which, except of course in winter, means a long day's work. This may be partly owing to the fact that the small farmer exists in such astonishing numbers, with in many cases his children and their wives and husbands employed with him.

In the smaller towns and villages one is struck by the apparent absence of the more usual facilities for amusements and entertainments, other than those which fall under the classification of sports and pastimes of an outdoor character. In the larger towns there are cinemas, concerts, and facilities for dancing; occasionally a theatre, or a hall suitable for theatrical performances, often a flourishing musical society, and the intellectual life and "cultural opportunities" generally appear to be on a much higher level than is the case in towns of a similar size in England. English books—novels, poetry, technical works and many in general literature—are much more widely read than is usually realized. This doubtless in some measure arises from the fact that English is widely taught in the schools.

The Government of Denmark is democratic, somewhat on the lines of that of England, and women have been enfranchised, and take, in many cases, more than a passing interest in politics and international affairs. The members of the Royal Family themselves are democratic, and go about amongst the people freely, as in the case of our own Royal Family. It often happens in a small country that there are really no marked class distinctions and Denmark is no exception: the nobility is a small body, characteristically polite to all classes alike.

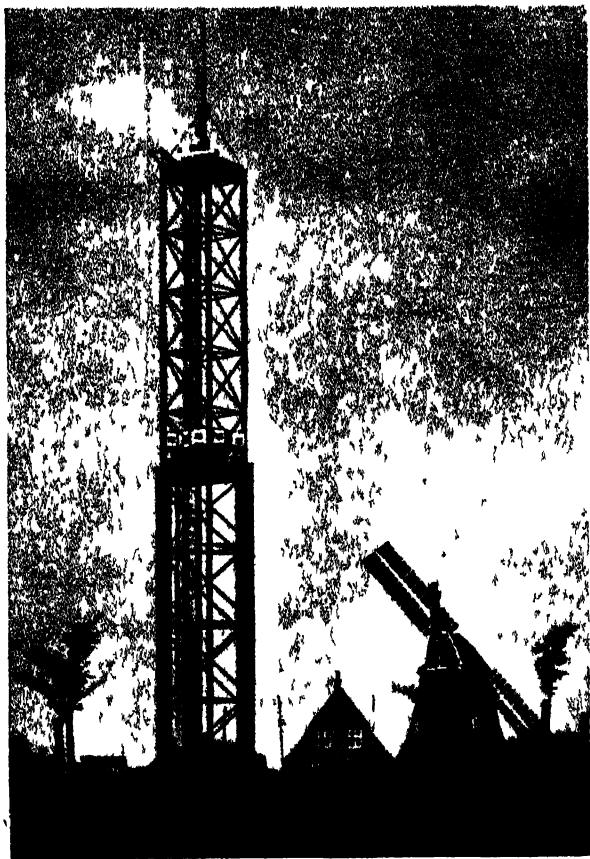
The land system has been the making of



INDUSTRY

Denmark's industries are chiefly those connected with agriculture. The picture shows the interior of one of the factories which produce some of the world's most famous bacon. Hundreds of whole pigs can be seen hanging

Photo. Danish Tourist Bureau



ODIN'S TOWER

This tower, near Odense, commands a view over the whole Island of Funen and surrounding islands

Photo Otto Normark

Denmark, and its foundations were laid as long ago as the last decade of the eighteenth century. Education has been the other chief factor which has evolved modern Denmark.

Education. Compulsory education dates back over a century and a quarter. In 1950 there were 4100 elementary schools. There are two Universities, one at Kjøbenhavn and the other, which was opened in 1928, at Aarhus; this is a separate corporation, in which a large proportion of the students study medicine. Besides the Royal Veterinary and Agricultural College, there are over twenty Agricultural schools. Training colleges number twenty. In addition to all these educational organizations there are also the State College of Engineering, the Technological Institute, in the capital, and the Commercial High School. Scattered over the country are some 200 other schools devoted to the objects of commercial training.

Adult education, too, has reached a high standard of efficiency and organization in

Denmark. A feature of this, peculiar to the country, is the Danish Folk High Schools, of which there were fifty-six in 1950. These are chiefly concerned with the rural populations. As a rule the schools have a winter course of five months for male students, and one of three months in the summer for young women students. The subjects studied are history, literature, economics, hygiene, etc. About a third of the youth of the country have passed through these Folk High Schools and agricultural schools during the last thirty years.

The Dane is physically a round-headed (in business, let us add, "long-headed") powerfully built man of middle height and upwards, often tending in later years to stoutness, for he is a notable trencherman. Denmark may justly claim to have the best, cleanest and most carefully and scientifically supervised food in Europe. It would not be very wide of the mark to describe the average Dane as "a laughing philosopher," not even averse to laughing at himself.

It can be claimed that the Danes occupy a high position intellectually among European nations; but they have a curious lack of imagination, and their lighter literature has suffered as a consequence. They have, too, a keen interest in, and capacity for, critical analysis.

Danish women are characterized by a natural beauty of complexion, and usually rather strength than fineness of lines in their figures. On the whole, like the men, they are



MEMORIES OF HANS CHRISTIAN ANDERSEN

The statue of Hans Christian Andersen's "Little Mermaid," on the shore of the sound, Kjøbenhavn

Photo Clive Holland



KJØBENHAVN

The Strand, where the fishmarket is held

Photo *Clive Holland*

fair, but, perhaps, in no country does one meet with more varied types.

Young Danes are excellent sportsmen, taking England as their model; they are fine seamen, and among the best swimmers in the world. Physical culture and gymnastics are practised by every Danish boy and girl, with the result that a fine and unusually healthy race has been produced in the case of the present generation.

The Capital City. Kjobenhavn, with its population rapidly approaching the million mark, is both one of the most interesting and most delightful of the capital cities of Europe. Situated on Zealand, and several islands, on the south-easterly shore, it is washed by the waters of the Sound, and that in a large measure accounts for its invigorating climate, the cleanliness of its air, and the salty tang that it has; and, perhaps, also has something to do with the clean exteriors of its public buildings and houses.

Kjøbenhavn is quite unlike any other capital city in many of its main characteristics. It is a very charming city and hospitable withal; its inhabitants are proud to show what industry and good organization can accomplish in the way of commercial prosperity and civic well-being. Equally, perhaps they are proud

that Kjøbenhavn has no real slums comparable with those of London, Paris and other capitals.

Kjøbenhavn has many fine buildings, but very few ancient, for the city has been devastated several times in, and since, the Middle Ages by disastrous conflagrations. There is street after street of interesting and commodious modern buildings, and others, dating back a couple of centuries or so, of red brick or white stucco, adorned very often with pilasters and cornices, and with delightful roofs—from the artistic point of view—of rust-red pantiles. These give many of the streets an old-world, if not ancient, and intriguing look. Of recent times in the suburbs many huge blocks of flats have sprung up.

The visitor in Kjøbenhavn notices at once that it is a city of spires and steeples, some of them quaint and picturesque, as that surmounting the ancient Borsen, or Exchange, formed of twisted "worm-dragons" tails, or that of the Frelser's Kirke, with convolutions like those of a shell. Especially dignified is that of the Christiansborg Palace with its summit adorned with a crown, in which handsome building are the Houses of Parliament, Foreign Office and other Government Departments, and the private Apartments of the King. Another fine spire is that of the Town Hall. It is also

a city of delightful parks and open spaces, in summer gay with exquisite flowers, to which the sky of this clime seems to have imparted a richer range of colour, or should one say less sunbleached tints? In these parks of the Rosenborg Palace, Ostre Anlaag, Faellen-Parken, the Frederiksberg Gardens, those of the Zoological Society, and Tivoli, to mention only a few, the children of Kjöbenhavn, sunny-haired and chubby-cheeked, have their paradise, and in many cases are provided with playgrounds having sand heaps and low, stone-topped tables on which to play with their toys.

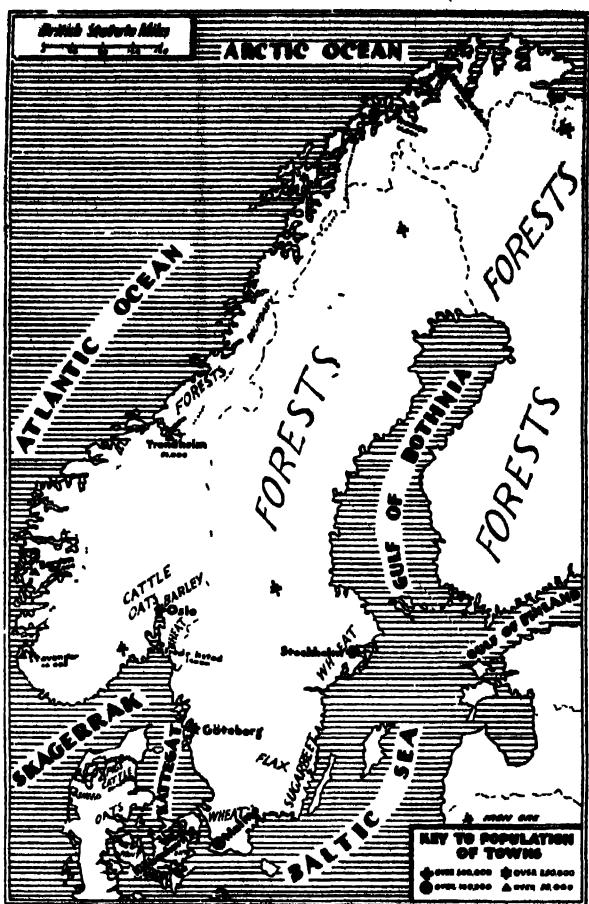
The canals and quays, with the fishing fleet coming right up into the heart of the city, add life, animation and picturesqueness to the scene; the broad boulevards and streets; numerous open-air markets, such as that for flowers and vegetables near the Absalon Statue on the Højbroplads and the innumerable cafés, serve to give the city a continental air.

The Tivoli, with its luxurious restaurants,



CYLING TO WORK

The cycle has been called the "first line" transport of Denmark
Photo Danish Tourist Bureau



beautiful park-like gardens, amusements, open-air theatre, dance floors and concert hall, is a very popular resort. Theatres of all kinds abound, though some of them are closed in summer. The chief is the Royal Theatre, on the south-eastern side of Kongehs Nytorv, one of Kjöbenhavn's principal squares, which is run somewhat on the lines of the Comédie Française in Paris, or the Scala, and specializes in witty revues.

For lovers of the Arts there are the National Museum, with its numerous fine collections; the admirable Ny Carlsberg Glyptotek, with fine pictures; the Mausoleum Museum of the great sculptor Thorwaldsen; and above all the unique and romantically beautiful, as well as artistically interesting collections which have belonged to various Danish sovereigns, assembled in the picturesque red brick Rosenborg Palace. Here are also kept the Crown Jewels.

Beautiful fountains grace the streets and squares of the city; for example, the ever-popular Stork Fountain at the broadest part of Amergertorv, and the fine Gefion Fountain,

with its miniature waterfalls and legendary interest, at Langelinie, the yachting centre. Then for those who search for ancient and picturesque survivals there are a few such buildings still to be found on Amager, and the Admiral Geddes Gaard, in the Kobmagergade.

One must not overlook the great Free Port, with its miles of busy quays, huge warehouses and stores, of which the city is so justifiably proud.

Kjöbenhavn is in the best sense an epitome of the nation itself. It strikes one as the prosperous capital of an extremely industrious

and well-ordered community, which is happy, likes to be amused, and finds life more tolerable than do the inhabitants of many other cities.

Aarhus, the second largest town, is the seat of a new University, opened in 1928, and a place possessing interesting survivals, and also a unique outdoor museum of old buildings gathered together in a pleasant park. The town has, too, industrial, commercial and shipping interests, and stands on a wonderful fjord, with a magnificent sea promenade from which one obtains fine views of distant islets.

Norway

THOUGH Norway is part of the Scandinavian peninsula it is to most people an island. Nearly all links, except that with Sweden, are by sea. Wild, mountainous Lapland, that links Norway to Finland and the Union of Socialist Soviet Republics, is seldom traversed. The traveller to Norway by sea is faced with a high, rugged land which on nearer approach is found to be fringed by low islands and reefs. There are said to be over 100,000 islands and islets along the 900 miles of Norwegian coast between Stavanger and the frontier of the U.S.S.R. A small vessel can pass in sheltered waters behind the islets and reefs along most of the extent of the coast, only rarely having to round a headland in the open sea. This belt of islands and reefs is known as the *skjaergaard*. Although beacons and lights abound, no vessel can venture along the tortuous passage of the *skjaergaard*, the "inside" passage, without the services of a pilot. The famous and perhaps over-rated North Cape in latitude 71° 11' north lies on an island.

The explanation of this coastline lies in the physical history of the Scandinavian peninsula. The whole peninsula represents the worn stumps of a very ancient mountain range, the so-called Caledonian foldings of early Palaeozoic times which occur also in Highland Scotland, north-western Ireland, western Spitsbergen and eastern and northern Greenland. These ranges were worn away to their bases during millions of years of weathering and then in the Quaternary Period the whole peninsula was enveloped in a vast ice-sheet. The moving ice continued the destruction which running

water and the atmosphere had been effecting through vast ages. Valleys were deepened and their floors rounded, soil was removed from uplands, rocks were smoothed and rounded, and the debris carried either to the adjacent lowlands or out to sea. Then at length the ice finally receded, leaving only vestiges on the highest areas, the land rose and temperate climatic conditions gradually enveloped it.

Glaciers, Mountains and Fjords. Glaciers in Norway now cover some 2000 square miles. Of these the Jostedals-brae, Jotunheim and Folgefond lie around Sogne Fjord and Hardanger Fjord. Svartisen lies on the Arctic Circle and a few small glaciers occur in the far north. Only one, in Jökul Fjord (latitude 70° north), reaches the sea.

But if Norway has few glaciers it has much bleak, inhospitable land: in fact most of the country is a highland plateau, though heights of over 6000 feet are not common. The greatest heights lie grouped around the head of Sogne Fjord. The Dovre Fjeld includes Snehaetta, 7550 feet, Jotun Fjeld, 6795 feet, Glittertind, 8140 feet, and highest of all Galdhöpingen, 8332 feet. The Hardanger Fjeld rises to 6063 feet in the south. All the wide southern part of the country, except around Oslo Fjord, is mountainous, and even in the north, where the general elevation is lower, there are several peaks of over 6000 feet on the Swedish and Finnish frontiers.

The highest mountains in the peninsula, which form its main watershed, are called the Kjölen, or Keel, and this forms the frontier with Sweden in the north and middle. In the south the country is wider and the frontier lies

farther to the east, but it is, except in the extreme south, in an equally mountainous and not too accessible region. Thus if Norway's coast is vulnerable her land frontiers are largely protected by physical conditions.

The ancient plateau falls abruptly to the sea in the west, probably originally truncated by great faults, and that coast is cut by long branching inlets known as fjords—steep-sided narrow arms of the sea that once were glacier-filled and earlier still were river valleys. Some are long: Hardanger Fjord is seventy miles, Sogne Fjord 100 miles. Several, like Vest Fjord, separate islands from the mainland. All are useful waterways. Oslo Fjord is the largest and most important of all. These fjords provide some of the finest scenic features of Norway.

The rivers of Norway are numerous though nearly all are torrential, useless for navigation, but often valuable as sources of water power. The principal river is the Glommen, which has an unusually long course of 400 miles. Parts are useful for timber floating; several falls afford water power, but most significant is the lowland route which its valley affords between Oslo and Trondheim.

As is usual in a formerly glaciated land, lakes are very numerous. They cover over two per cent of Norway's area. Most are long, narrow and deep, and they often lie in chains. Mjøsen, with an area of 140 square miles, is the largest.

While some lakes form useful links in lines of communication, more are of importance in acting as reservoirs for spring floods and so regularizing the flow of rivers. Many of the lakes freeze in winter.

Climate. Norway has a climate much more temperate than its latitude would suggest. Most of the country lies north of the latitude of Labrador or even of southern Greenland, yet only at high elevations is there any suggestion of a polar climate. A third of the country lies north of the Arctic Circle, to the great joy of tourists, who feel, quite unwarrantably, the thrill of perilous adventure in going to northern Norway. The latitude of Norway gives practically the whole country, except in the extreme south, uninterrupted daylight in June and July. At the North Cape the Sun is above the horizon from 12th May to 29th July. But there is of course a corresponding period of darkness in winter.

Norway is saved from an Arctic climate by oceanic influences. The warm North Atlantic Drift flows north along the coasts and round the North Cape towards the Barents Sea. The waters of this Drift prevent the coast being ice-bound or harbours being frozen. In this connection too it may be noted that the relatively shallow sill to all fjords prevents deeper cold water entering from the open sea.

Another important reason for the temperate



OSLO FJORD
Bathing beach at Tjomo
Photo Norwegian State Railways



AGRICULTURE

A mountain valley showing the pine forests and pasture fields

Photo Norwegian State Railways

climate is the prevalence of strong westerly and south-westerly winds and moving cyclones. The westerly winds blowing over the ocean are relatively mild and bring open conditions even in winter. Naturally, on the high plateau and in the interior generally, away from oceanic influences, winter temperatures are lower.

Summer is cool and only occasionally hot. In the interior the summer temperatures tend to be higher, except at high elevations where only a spring-like summer breaks the monotony of the long winter.

Norway has plenty of rain and some snow on the west coast and more on the highlands. Forty to sixty inches of rain and snow during the year is the average along the coast, including some thirty days of snowfall in the south to about one hundred in the north. Eastward, away from the ocean, the amounts of both rain and snow diminish. There is frequently finer and clearer weather at the heads of the fjords than on the coast. On the coast snow is liable to melt even in midwinter, but at high elevations and in the east, including Oslo, it lies on the ground for many weeks.

Thus it may truly be said that the coasts of Norway have a wet, cool and stormy climate, punctuated by short periods of calm, cold weather in winter and fine, warm weather in summer. Eastward the climate shows greater extremes and is more comparable to that of central Europe.

While Norwegian ports are practically always open to shipping it may be noted that a little ice forms in Oslo Fjord and other southern ports and at the head of some of the fjords, but seldom to a greater thickness than can easily be broken by an ice-breaker or a strong steel vessel. The iron-ore port of Narvik in latitude $68^{\circ} 27'$ north was founded in 1902 for the winter export of Swedish iron ore when its Baltic outlets were frozen and inaccessible to cargo vessels.

Vegetation. In most parts Norway's climate is suitable for forest growth, not always of a strong and vigorous type. White pines and spruces are the chief trees, the pine on drier and the spruce on wetter ground. On the whole, the birch is the most hardy tree and one that is very characteristic of the coastal

regions. In the northern part of Norway these open birch forests with their abundant under-growth grow from sea-level up to 1600 or 2000 feet. In the south, however, the conifers are most numerous, especially in inland districts away from the strong winds of the coast, and there are bilberries in abundance in the spruce woods and whortleberries in the pine woods. At lower levels in the south there are some oaks, maples and elms, but most of Norway has not the climate suitable for these more southern trees. Above 1600 feet in the north and above 3000 feet in the south there is a treeless Alpine vegetation with heather, willows and other low growing bushes, lichens, mosses and, in badly drained places, peat bogs. This is very similar to the tundra of the Arctic coasts. The peat of Norway is abundant but, as in other lands, is of little economic importance.

As with the vegetation, so among the wild creatures of Norway contrasts exist between the north and south. In the north are the reindeer, now only tame herds, polar hares, lemmings and such birds as the snow bunting, snowy owl and ptarmigan. There are also Arctic birds that move south in winter, such as eider ducks, guillermots, little auks, etc. On the other hand in the south there are animals more characteristic of central Europe. They include the elk, roe deer, red deer, bear, stoat, weasel, badger, hedgehog and game birds such as the capercailzie, grouse and partridge. Bear and lynx are almost exterminated and the wolf is rare. Eagles are often to be seen. Among the fish that have made the rivers and lakes of Norway famous are salmon, trout, red char and pike.

The Inhabitants. The greater part of the population of Norway is of the tall, fair, long-headed type, sometimes called the Nordic type. These characteristics are found particularly in the people of the fjord region of the west. Around the southern coasts a smaller, dark, round-headed people is also noticeable. These may be regarded as the Alpine type which is characteristic of southern and eastern Europe. They probably spread northwards via the Danish peninsula where the type is not uncommon. A third racial type is found in the north of Norway, a people of Mongolian extraction who were, perhaps, the earliest people in Scandinavia. They are the Lapps, often called Finns or Kvener, and are found chiefly in Finmark where they are either reindeer breeders or fishermen. Many, however, have adopted the life of the Norwegian peasant-

fisher. The Lapps number some 30,000 among the total Norwegian population of 3,280,000.

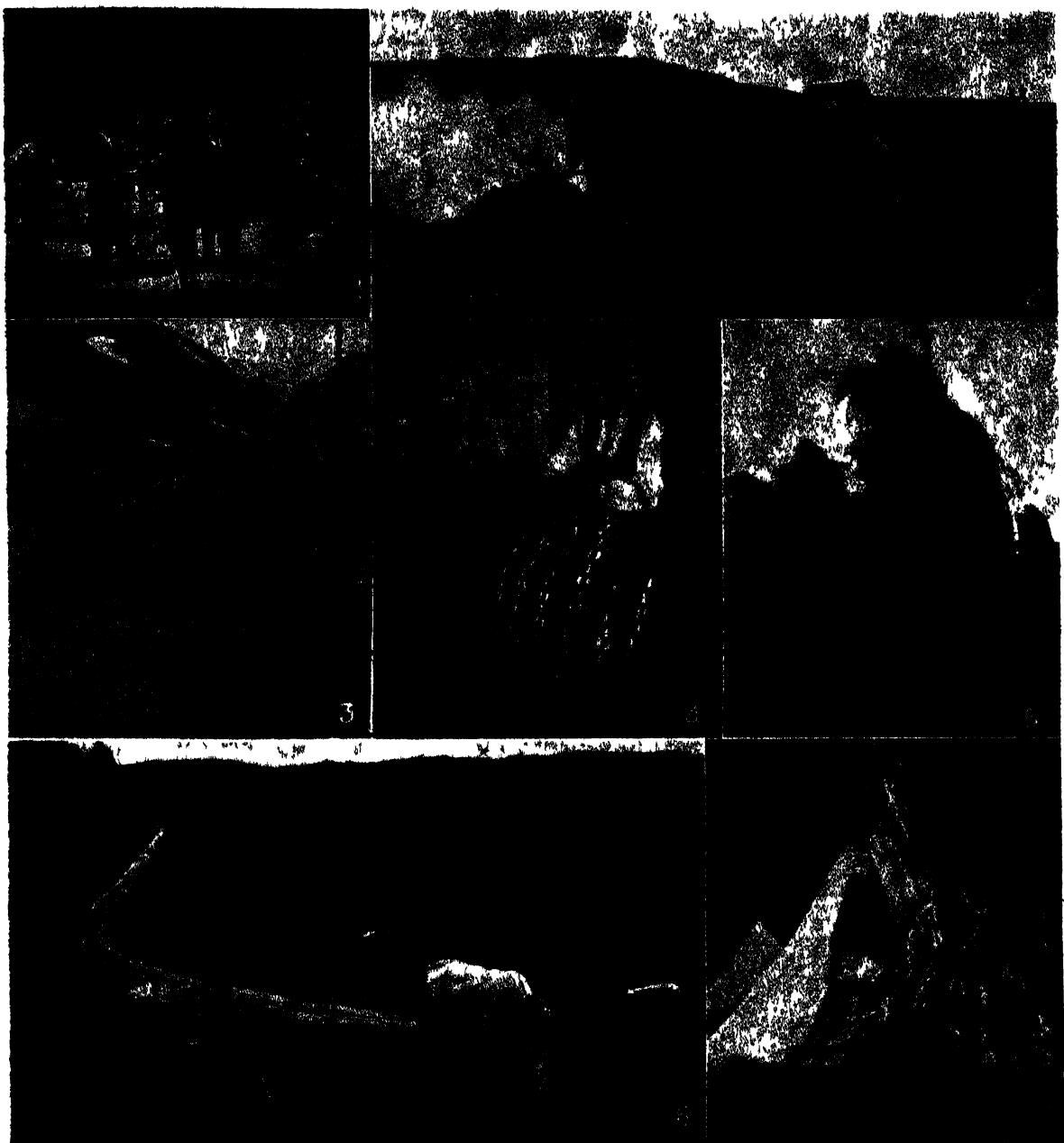
Somewhat degenerate specimens of Lapps and alleged Lapps frequently present themselves to tourists at northern Norwegian ports in summer, but the physique and morale of the race is not to be judged by these.

Norwegians have been wanderers since the days of the early Vikings. The scanty wealth of the homeland drove them to the sea and seamanship learned in the stormy waters of the North Atlantic gave them confidence in voyaging over unknown seas. The Viking discoveries of the Orkneys, Shetlands, Faeroes, Iceland, Greenland, and even of America, are well known. But these discoveries led to little emigration. Modern emigration is not more than a century old and dates from the opening to agricultural pioneers of new lands in North America. The stream increased slowly in volume until the eighties of last century, when, in 1882, 28,000 Norwegians emigrated. During the next fifty years the total number of emigrants was about 600,000. In the 1920-30 decade, it had fallen to small numbers: in 1951 fewer than 3000 went to North America.

Crops and Cattle. In no country in Europe is population scantier or more scattered than in Norway. A population of just over three and a quarter million, or less than half that of London, in an area equal to twice that of England and Wales, gives a density which, outside the larger towns, is scarcely noticeable on the face of the country. Many parts, especially in the high interior, are wholly uninhabited. Population from the earliest times has clung limpet-like to the coasts. Wherever there is a patch of tillable ground or pasture there has been a homestead from early times. Low islands and alluvial flats offered the best sites. Upland pastures are little used, except in the south, for other than temporary summer settlements or *saeters*. The interior valleys have some population especially in their sunnier parts, and in the south and around Oslo the density is quite noticeable. In the north population is very scanty.

On the poorer sites the old primitive stone and turf dwelling remains, but the richer farms have timber houses on which corrugated iron is often used. Hay and potatoes are the chief crops and the wetness of the climate often demands the exposure of the hay on stone walls or wire fences to ensure drying of the crop.

Barley and oats are the chief cereals, but a



COUNTRY SCENES IN NORWAY

1. National costume. 2. Burning seaweed for iodine. 3. A pony-cart; the chief means of transport in the mountainous districts.
4. Hand-weaving, an important rural industry. 5. Drying the hay. 6. Fertile pastures of the south. 7. A Lapp camp in the extreme north

Photos: Blue Star Line; Norwegian State Railways

little wheat is grown in the south. The necessity for saving the meagre crop of hay for winter feed entails the summer use of the hill pastures for cattle. And not infrequently winter feeding is a serious problem: seaweed and even fish offal occasionally have to be fed to the cattle in order to eke out the fodder

supply: this is to the detriment of the milk. The poverty of the coast lands compared with the wealth of the sea has long induced the two-fold economy of peasant and fisher in the coastal population. Farm work is the chief occupation in summer, but fishing occupies the men in winter, when the women and girls can tend



WATER POWER

A power station at Ryukan, where the pipelines on the left are seen side by side with the natural waterfall

Photo Norwegian State Railways

the cattle. All the year round local fishing provides the chief food.

Only 3·6 per cent of Norway is under cultivation and over 70 per cent may be classed as waste land. Yet, in view of the small population, agriculture is not unimportant and the small size of most farms leads to careful cultivation: the soil is made to produce its maximum yield. Most of the farms are small holdings and there is little tenant farming. The country has to import considerable quantities of grain but is self-supporting in vegetables and small fruits and until the second World War in most animal products. Milk, eggs, butter and cheese were even exported in small quantities. A new agricultural industry is the breeding of silver foxes.

Where water routes meet, generally near the mouth of a fjord or on an island site, villages and small seaports arise, each the focus of a considerable area and the meeting place of coastal and fjord steamers and sailing ships. The town is often crowded along the deep water access and the scanty lowland. Of old it was built entirely of wood, but now, owing to

the danger of fire, the use of concrete is compulsory in the larger towns. The bigger centres have a few shops and an hotel or two, but the smaller are little more than a wharf and some scattered houses. Often a church has a dominating place. The use of bright paint—for paint is needed to preserve the wood—and numerous Norwegian flags do much to add a cheerful appearance to these villages and small townships.

Fisheries. In one form or another the sea and sea-faring are the livelihood of a large proportion of Norwegians. The call of the sea is coupled with the urge from the land: food in abundance in the sea, food in scarcity on the land, has made a sea-faring people, and fishing is still one of the chief interests of Norway. Any traveller off the tourist track will recall the persistence of fish in his diet, the scarcity of meat and the prevalence of the potato.

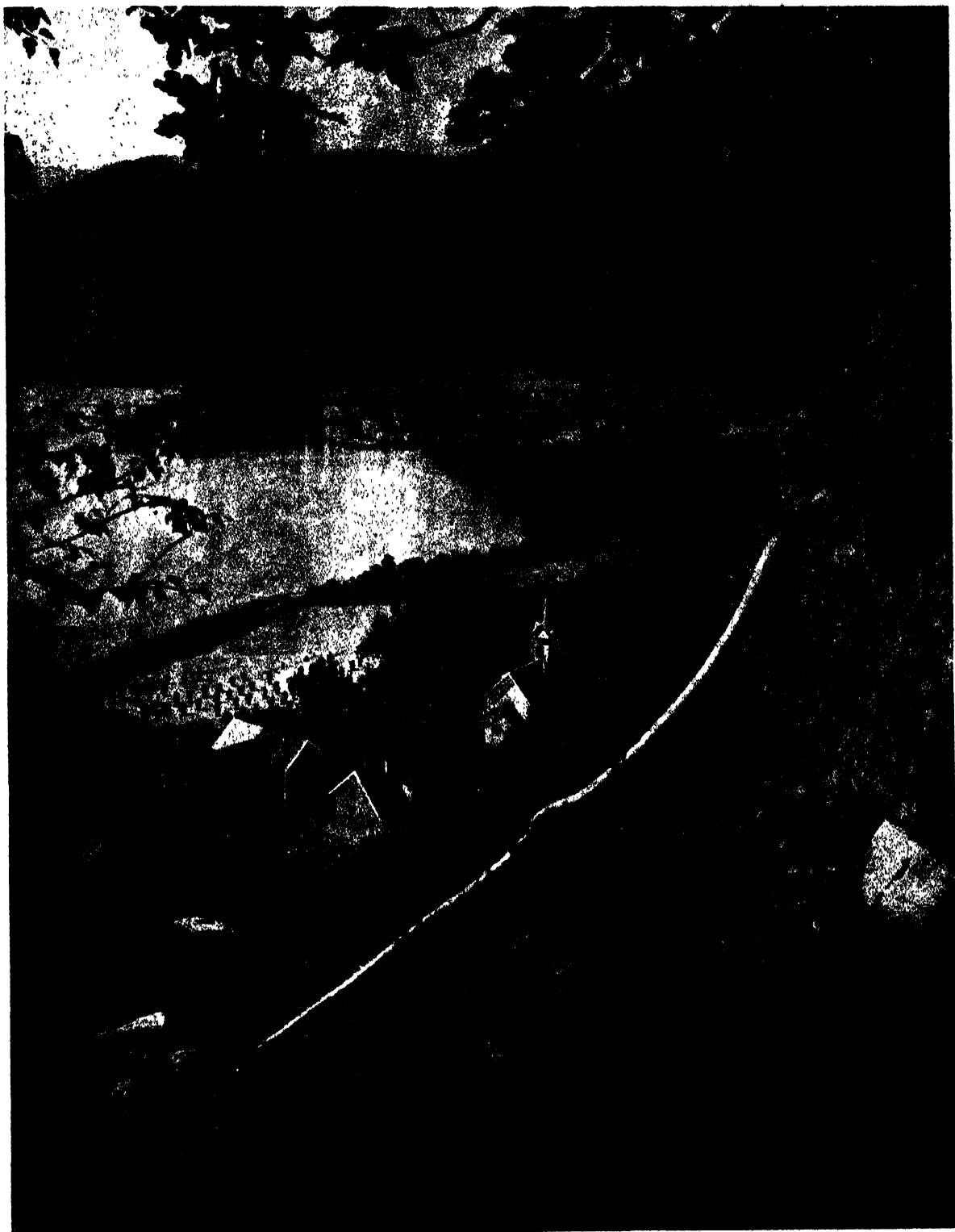
The inner parts of the fjords, with much fresh water, are poor fishing grounds, but the outer ends and the inshore waters abound in various kinds of fish. Thus the ancient Norseman was lured to the open sea, and learned to



A CHURCH OF THE HILLS

A 600 year old timber-framed gabled church at Laerdal

Photo Norddeutscher Lloyd

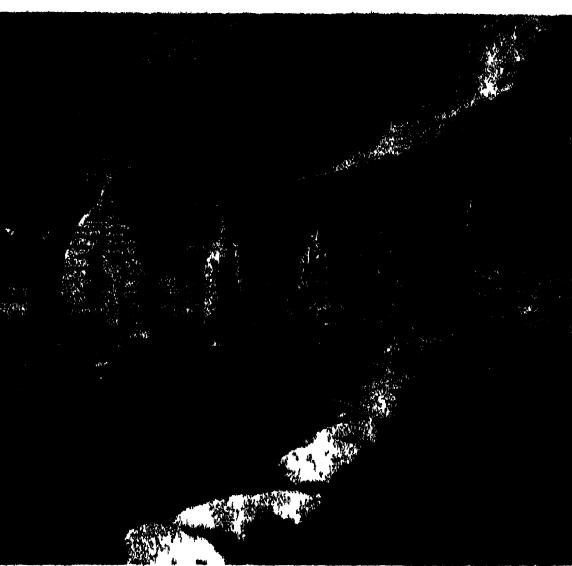


HARDANGER FJORD, NORWAY

Photo: Norwegian State Railways

build sea-going vessels. The rocky sea floor does not favour flat fish, but "white" fish such as cod, haddock and whiting are numerous. Apart from the local fishing of every coast-dweller for his own use, there are several large-scale fisheries which draw men from all the coast to catch fish in millions. Of these the most famous is the Lofoten cod fishing in mid-winter. At that season the cod move inshore to spawn and early in January several thousand boats and many thousand fishermen from north and south move to the Lofoten Islands and Svolvaer, the chief village, becomes a busy port and a small town. The fishing in winter darkness in the stormy Vest Fjord is a wild, cruel life and takes its toll of the fishers, but in a good year the profits may be high and afford the peasant fisherman the money which his small farm cannot provide.

Ashore the fish is split open, gutted, and dried or salted. The dried fish is stockfish or *törfisk*; salted fish is split cod or *klipfish*, and this is the principal form it takes. Stockfish goes mainly to Italy and western Africa; split cod to Spain, Portugal and South America. Cod roes go to the French sardine fisheries for



A SUMMER FARM

A "saeter" or summer farm. Each Spring cattle are driven to the mountain pastures where women remain to tend them, living in these wooden huts with roofs of turf

Photo A. N. Wells

bait. The Romsdal district has a smaller cod fishery about the same season. Equally as important as the Lofoten fishery is the Finmark fishery of capelan from February to May. The capelan is a kind of salmon which comes inshore to spawn. The fish are dried or salted. Herring fisheries off south Norway and off Nordland are important and draw hundreds of boats in a good season. Stavanger and Haugesund are the headquarters in the south: Tromsø in the north. The season is summer and autumn. The fish are exported in salt or fresh, and a small kind are tinned and sold as *sild*, for the true sardine does not occur in Norwegian waters. Another important sea-fish is the mackerel: most is salted for export.

In most years no country in Europe except Great Britain lands so much fish as Norway. Much of it is exported dried, salted or tinned. Cod liver oil is another export, having become much more important since the discovery of its high vitamin content.

Whaling. Whaling is another important Norwegian industry, but is carried on no longer on the coasts of Norway. Norwegian fishermen, arguing that the killing of whales was prejudicial to the coastal fisheries, succeeded in securing its prohibition by the Government, accorded the more readily since the supply of northern whales was rapidly decreasing and that of southern whales seemed unlimited. It was Norwegian enterprise that re-opened



A FJORD OF WESTERN NORWAY

A view of the Leonvand. In August, 1937, part of a mountain collapsed into the lake, the consequent wave sweeping away buildings, trees, and roads, and resulting in considerable loss of life

Photo: A. N. Wells

whaling in the Southern Ocean in 1905 with a station at South Georgia. It has since spread all round the Antarctic and is now carried on by fast whale-catchers and large factory ships which do not require harbours. The chief whaling companies are Norwegian and the British whaling companies use chiefly Norwegian personnel. Norway produced in 1950-51 about fifty per cent of the total whale oil put on the market: her share amounted to nearly a million and a quarter barrels. In former years before the market was glutted and when whales were more numerous the amount was much larger.

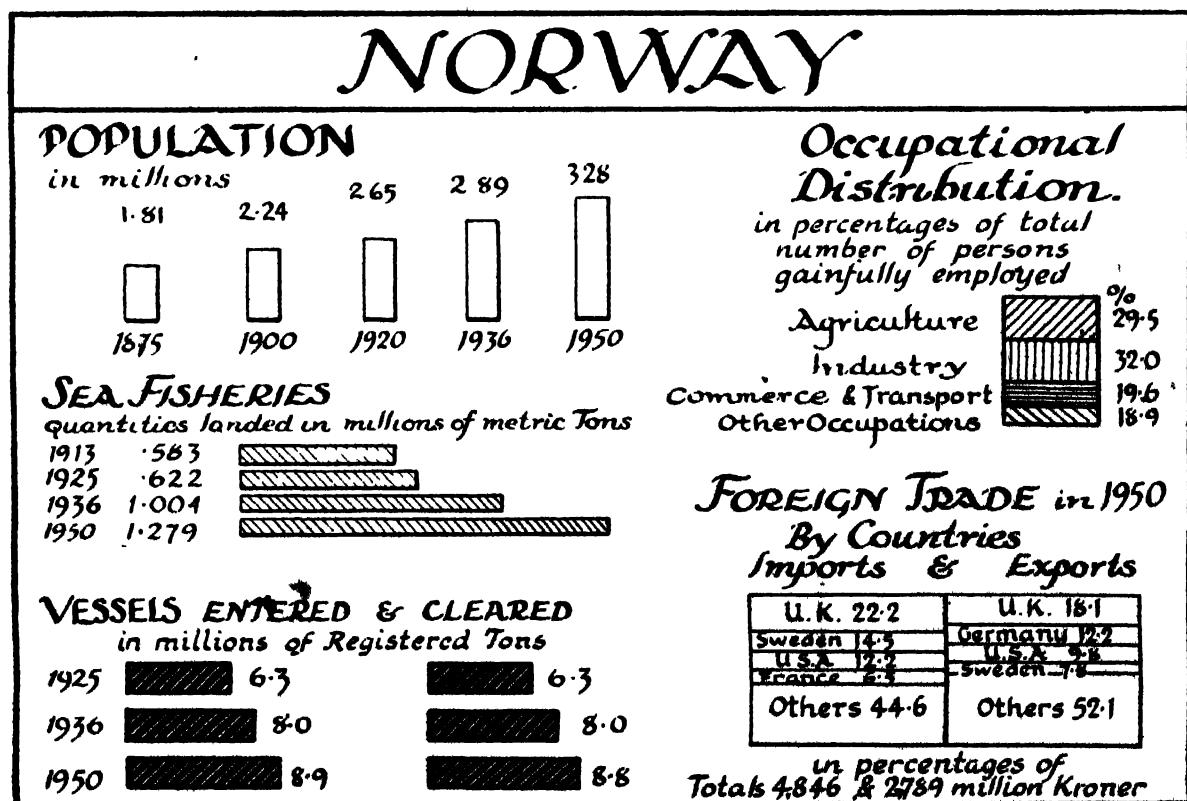
Mercantile Marine. Lastly, the maritime interests of Norway are expressed in her large mercantile marine which is chiefly employed in carrying other nations' trade. The saying that every port in the world harbours a Norwegian ship is only a slight exaggeration. A merchant tonnage of 4,835,000 in 1939 was exceeded only by Great Britain, the United States of America, and Japan. In 1950, with rather more than 2000 vessels, the gross registered tonnage had increased to 5,500,000.

A worthy record of old Norwegian prowess at sea is to be found in the three Viking ships

preserved in Oslo. These are the genuine vessels which have survived the march of time.

Lumber and Minerals. Timber and timber products also loom large in Norwegian economy. The coastal districts of the west, exposed to strong winds and lacking in soil, have forests of birch only, except around Trondheim Fjord and Namsen Fjord where there is much spruce. Reckless cutting in the past has deforested many areas, but great forests of spruce and pine survive in the east and north. About 20 per cent of the land is still forested. Fredrikstad, Halden, Sarpsborg, Namsos and Trondheim are among the chief timber ports. Water power drives many saw mills and facilitates the export of cut timber at many ports. In addition there are many pulp and paper mills giving considerable employment and providing exports of value. Chemical and mechanical wood pulp together rank highest in value among Norwegian exports.

Norway is not rich in mineral wealth for though many ores occur they are generally of poor quality or of small amount. There is no coal, but Norwegian mines in Svalbard are sending annually increasing amounts for use on railways and steamships. Most of the coal,





FISH DRYING AT HAMMERFEST

Photo Blue Star Line

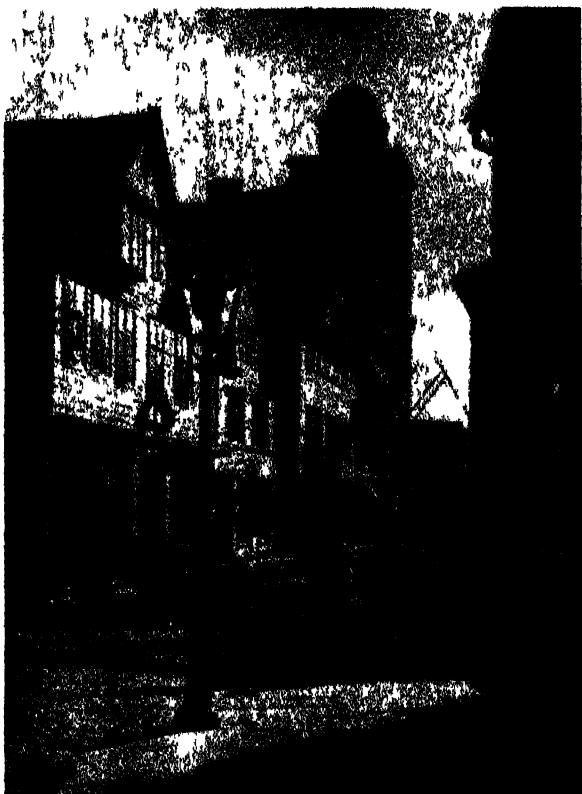
however, is imported from Great Britain. There is no mineral oil. The chief mineral is iron ore, which is widespread but not of high quality. Lack of fuel long hindered any large-scale use of the ore but nowadays hydro-electric power has caused a revival of iron mining. Some of the best ore is in the south, but the chief deposits are in the far north on Varanger Fjord; their strength is concentrated from 30 to 70 per cent. Iron for export in this region alone accounts for over three-quarters of Norway's output. Farther south the port of Narvik, like other Norwegian ports unfrozen in winter, handles huge quantities of high grade iron ore, which comes by rail from the mines of Gällivara and other places in Swedish Lapland. Norway's own production of pyrites and other iron ores totals annually about 1,500,000 tons.

Copper ores, both copper pyrites and cupiferous iron pyrites, are widespread and increasing in importance. The output of copper ore alone is over 20,000 tons. Nickel, titanium, cobalt and zinc ores are also mined. Copper, zinc and nickel are produced from the ores and

there is some import of raw material. For the greater part, however, metals and metallic goods have to be imported, though the manufacture of pig iron has grown. It was 63,400 tons in 1950.

In the days of wooden sailing ships Norway was admirably suited for ship building; nowadays, with steel construction, the advantages are less marked. Nevertheless a considerable tonnage is built every year. Whaling ships, as in the days of wooden construction, are still a speciality.

Electro-chemical industries are favoured by the abundance of water power. Carbides, nitrates and, particularly, aluminium are important products. Norway produces about 10 per cent of the world's aluminium, although the bauxite from which it is produced is not mined in Norway. Few lands exceed Norway in water power resources. There are said to be 80,000 million kilowatt hours available annually, of which about one-fifth are being utilized. The principal plants are in the south and in the Glommen Valley, and the proximity of much power to the sea facilitates the import of



BERGEN

A street scene showing the timber-built houses characteristic of many Norwegian towns. Stone buildings, such as that in the background, date from the re-building of the town after the Great Fire of 1916.

Photo A. N. Wells

raw material and the export of manufactured goods.

The quarrying of granite, gabbro and labradorite for paving, building, and monumental purposes used to be more important than it is to-day. The export of ice, stored in pits after having been cut from frozen lake surfaces, has been killed by the artificial manufacture of ice wherever it is required.

As in other lands, with the growth of manufactures urban population grows at the expense of rural. Over 30 per cent of the total population lives in towns; but the towns are small. Oslo alone has over 400,000 inhabitants, Bergen has over 100,000 and only four other towns are above 20,000. All may be regarded as comparatively modern in contrast to the antiquity of population in this country. No town seems to date from earlier than the twelfth century.

The Cities. *Oslo* (population 429,000) occupies a site of commanding value. The long Oslo Fjord leads into the heart of the only large lowland area in Norway and at its head

the fjord broadens to a fine sheltered anchorage. Here is the natural focus of sea and land routes and of east and west traffic. Modern Oslo, founded by a Danish king in the seventeenth century, had, however, a rival in *Bergen*. Rivalry between the two towns to some extent persists, though Oslo, as capital, is the larger. The long subjection of Norway to Denmark made *Kristiania*, as it originally was called, the chief town in Norway, and the union with Sweden did not stop this tendency; on the return of Norway to complete independence the old name of *Oslo* was revived. The name was that of an older town of the eleventh century and had persisted in one of *Kristiania's* suburbs.

In recent years Oslo has become an industrial town with textile mills, foundries, machine shops, etc., but it has nothing of the gloom of most industrial centres. It is mainly modern, with little of historical interest, and, though one may question if the city takes full advantage of its superb site, there can be no doubt that



A MOUNTAIN PASS

Motoring between high walls of snow in early Spring
Photo Norwegian State Railways

its main thoroughfare, Karl Johan Gade, is worthy of a capital city. With gentle gradient this wide street stretches from the harbour, with flanking buildings of Storthing, Opera House, University and many gay shops, to the Royal Palace and its open park. Suburbs and summer dwellings spread down the fjord and on its

of the town was destroyed by fire early this century—a not uncommon fate of Scandinavian towns—but it has now been rebuilt on an ampler scale. Its site makes Bergen an unforgettable town, but has the disadvantage of giving it a very heavy rainfall.

Stavanger, farther south, is half the size of



INDEPENDENCE DAY

The celebrations of the 17th May at Oslo

Photo: Norwegian State Railways

islets and give animation to the whole district. Nearby is Holmenkollen, famous for its ski competitions.

Bergen, the second city of Norway, with a population of about 110,500, is a great seaport and has several industries. Lying well removed from the open sea but easily accessible by deep, sheltered channels it may be regarded as the focus of the coastal steamers as well as the centre of fishing interests. Founded about 1070, Bergen became in time a great Hanseatic centre, and some of the old houses from those days have been preserved. Much of the centre

Bergen and lies on the edge of the best dairy districts of Norway; but the town's interests lie in fish. Its name on tins is known throughout the world. Around the southern shore of Norway there are many other small towns, all much alike in appearance and interests. Sandejord and Tonsberg recall whaling ventures.

Trondheim, with a population of 57,130, has a central site in the one considerable area of lowland on the west coast. Like Oslo, it marks a focus of routes and the centre of a fertile region. The railway from the south ends here and there is a line through a lowland gap in the

Keel across the peninsula between Trondheim and Sweden. Founded as Nidaros in 996 it was long the capital of Norway, and its beautiful Gothic cathedral that dates from 1200 is still the place of coronation of the Norwegian kings. In 1530 fire destroyed most of the town, and though many wooden buildings still stand, stone and concrete only are allowed in new construction. The wide streets and rectangular plan are rather prosaic, but the commercial part around the old harbour is picturesque.

In the north a few small towns have fishing and Arctic interests. Tromsö with 11,000 inhabitants is a finely placed but straggling town of wooden buildings, busy with Arctic hunting, and concerned with mining and polar exploring expeditions; it may be regarded as the metropolis of the north. Hammerfest, much smaller, is the world's northernmost "town."

Svalbard (Spitsbergen), a group of Arctic islands 400 miles north of Norway is Norwegian territory. A description of these islands is given in the chapter on Arctic Lands.

Norwegian export trade, mainly in timber, timber products and fish, is slowly widening its scope and now includes some manufactured goods. The principal trade is done with Great Britain and Sweden. Excess of imports over exports is compensated by the earnings

of Norwegian merchant ships in the world's carrying trade. There is also the considerable income from the tourist industry for which all Norway caters on a large scale.

Communications. The rugged nature of the country makes transport difficult and the winter snow blocks the upland roads. The prevalence of coastal population allows sea communication to serve most towns, and steamers run to and fro along the coasts with a regularity greater than that of most train services. Routes are facilitated by the sheltered waterway offered by the islands and outer reefs, which provide calm water for almost the whole extent of the coast from the Naze to Varanger Fjord. In the interior the lakes are used for transport and are often linked by road or railway. The railways are in the southern half of the country: the far north has none, except the mineral line to Narvik from Sweden. One of the most remarkable lines in Europe is that between Bergen and Oslo which in a distance of 305 miles traverses 178 tunnels and climbs to 4265 feet: nevertheless it is kept open throughout the year. No land has a wider spread net of telephone lines than has Norway. The Scandinavian Airlines System was formed in 1946 for inter-continental traffic and services between Scandinavia and the Americas.

Sweden

IN order to illustrate Sweden's great extent from north to south, the mental experiment is sometimes made of placing a vertical axle through the southernmost point in Scania and afterwards turning the whole land around towards the south. In this way, Sweden's most northerly point reaches as far as the neighbourhood of Napoli (Naples), in Italy. The geological "backbone" of this lengthy territory consists of the ruins of the old mountain chain, the "Caledonian Range," which towered up during the Cambrian-Silurian period and stretched as far as from North-west Ireland and Scotland to the Scandinavian peninsula, but which only in northernmost Sweden forms a pronounced boundary to the neighbouring country of Norway. In the most northerly part of Sweden the mountain range attains its greatest height—2135 metres above sea-level—at the peak of Mount Kebnekaise.

Seen as a whole, the Swedish landscape receives its character in high degree from the solid foundation of rock, which derives its origin from the oldest phase in the development of the Earth, the Archaean, and from the inland ice, which, during relatively late geological time, passed over the land like a plane, sculpturing and polishing the detail forms of the bedrock, deepening the river valleys and lake-streams, but also depositing loose sediment in the form of moraines, ridges, etc., upon the relatively level bedrock. These ridges are specially characteristic as *eskers* in the country around Lake Mälar and in the Stockholm district, where, high and forest-clad, they traverse the terrain and often form the foundation of the oldest country roads.

The post-glacial sea, which, after the Glacial Period, covered the whole of central Sweden, so that a broad arm of the sea straight across the

land then united the Baltic with the Kattegat, deposited in its regression the fertile clays which now constitute the country's best cultivable land. The highest level attained by the prehistoric sea, the marine limit, is, therefore, an important boundary-line for agriculture, since below this limit commence the more fertile marine clays. Also as an important factor must be added the process of land elevation, which, after the Glacial Period's pressure over the land had been lightened, raised the argillaceous plains above the water and made them accessible to the first agriculturists.

is Canada, with its similar bedrock and soil stratum. It is this lightly undulating primitive rock topography, clothed in light green during the spring and early summer, and with a multitude of interspersed small lakes, which places its stamp upon south and central Sweden and which represents the typically Swedish scenery. The profusion of lakes—recently up to approximately 100,000 lakes were counted in Sweden!—plainly appears during an air journey in clear weather between Malmö and Stockholm.

That part of Sweden which differs most from



NATIONAL COSTUMES OF SWEDEN

Left Folk dancing at Stockholm. Right A Lapp mother and her baby
Photos Blue Star Line, Swedish Travel Bureau

In the rocks and rocky knolls which project above the argillaceous lowlands of the central Swedish landscape, in actual fact the very oldest parts of the Earth's physiognomy lie bare, in contrast to England, for example, where the rock foundation is built up of a mighty layer of younger rocks. But this rugged countenance has since been "rejuvenated" by the grinding of the inland ice. The Swedish primitive rock landscape appears best in all its barren nakedness in the archipelago (*skärgård*) off the Province of Bohus on the west coast and in the archipelago eastward from Stockholm through Roslagen and along the coast of Södertörn.

A Land of Lakes. The country outside Scandinavia which best corresponds to Sweden

the genuine Swedish landscape is south-east Scania, which Linnaeus considered to resemble Denmark more than the rest of Sweden. In this part the primitive rock does not give the land its character, the soil consisting chiefly of fertile calciferous loams, derived from moraines. A similar "unSwedish" nature is possessed also by the Swedish Baltic islands, Öland and Gotland, with their limestone bedrock.

Sweden is rich in contrasts, both as to climatic conditions and as to vegetation and landscape types. In Scania the winter snow remains on the open plains for, on average, no more than forty-seven days, in the remainder of Gotland from fifty to ninety-five days, in Svealand from eighty-two to 140 days, in South

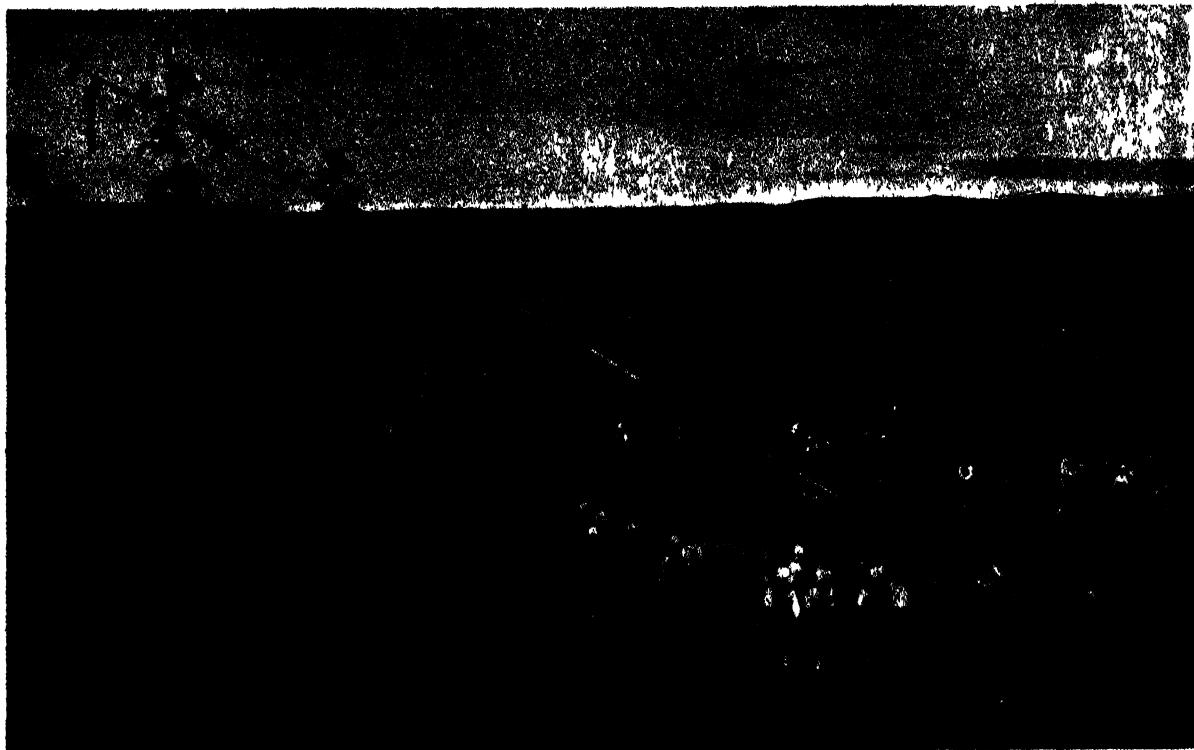
Norrland from 140 to 160 days, and in North Norrland from 170 to 210 days. On account of the country's projecting far towards the north, such cultivated growths as wheat, rye and sugar beet attain their northern limit of cultivability in Sweden, and, among the deciduous trees, the oak and the birch there reach their extreme limit of vegetation.

The highest mountain plateaux and the peaks in Norrland are lacking in all kinds of vegetation, and a number of them bear glaciers. The southern limit for the great north-European pine-forest belt, which is of so great an economic importance for the country, passes through the southernmost part of Sweden.

In Karesuando, Sweden's northernmost parish (Lat. $68^{\circ} 27'$ north), which lies well above the cultivation limit, and where the Sun remains above the horizon without a break for fifty-three days and nights (the "midnight Sun": 26th May to 18th July), winter commences as early as the beginning of October. In Stockholm winter begins towards the end of November, but in Göteborg (Gothenburg) and Lund not before the end of December.

Karesuando has a mean winter temperature in January of $+5.7^{\circ}$ Fahrenheit (-14.6° Centigrade) against Stockholm's $+27.9^{\circ}$ Fahrenheit (-2.9° Centigrade) during the same month, but the summer temperature is remarkably even throughout the country and without great variations. During the month of July Karesuando and Stockholm have an average temperature of $+53.8^{\circ}$ Fahrenheit ($+12.1^{\circ}$ Centigrade) and $+61.9^{\circ}$ Fahrenheit ($+16.6^{\circ}$ Centigrade) respectively, and Göteborg has $+62.2^{\circ}$ Fahrenheit ($+16.8^{\circ}$ Centigrade). In Sweden during the same summer month it is nevertheless possible both to go skiing from the highest situated tourist stations in Jämtland and Lapland and to go bathing at the holiday resorts among the rocky archipelagoes off Bohus Province or Stockholm or on the sandy beaches of Scania or Halland.

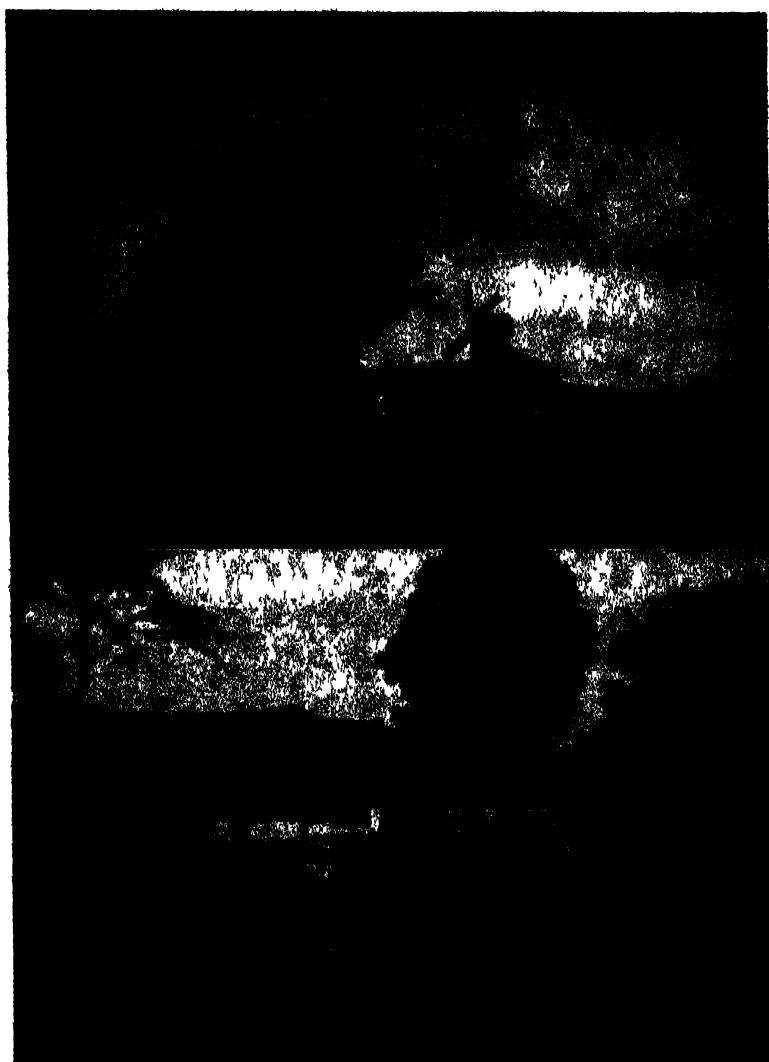
Scania—Centre of Cultivation. Thickly-populated Scania forms an intermediate link with continental Europe. It is that part of Sweden where the hand of man has most strongly set its stamp upon the landscape and transformed the original nature. It is a landscape of cultivation, where every square



THE LAND OF NIGHTLESS SUMMER
Raising the maypole at midnight on mid-summer night, at Leksand
Photo: Swedish Travel Bureau

kilometre bears traces of reclamation. The beechwoods have been compelled for the most to give way to the fields—Scania is the land of the great estates, the landed nobility, of rich production of wheat and sugar beet—the “granary of Sweden.” The cultivated land amounts to 80 per cent of the total area. But even during the journey by the State Railway from Scania to Stockholm, on the Småland plateau, appears the scantily-populated, typical Swedish landscape, great expanses of pine-woods interspersed with deciduous trees—a nature-landscape where the small circles of cultivation around the farm-houses lie like islands in a “forest sea,” but where the forests conceal ceaselessly working sawmills, carpentry workshops, glass-works and other industrial enterprises. Swedish industry is to a great extent spread over and localized to the countryside.

Central Sweden, i.e. the lowland around the great lakes Väner, Vätter, Mälär and Hjälmar, provides another aspect, one reminiscent of Scania. There lie the kernel districts of the Swedish realm, the two plainlands of Öster- and Västergötland on either side of Lake Vätter, bounded by tree-clad ranges. Together with the agricultural plains of the Mälär Valley, Uppland and Närke, they form Sweden's oldest cultivated districts, early and well tilled (approximately 40 per cent of the area is cultivated land). The cultivated tracts of east and west Sweden, with their religious and spiritual centres in old, medieval cathedral cities such as Skara in Västergötland and Linköping in Östergötland, are united by the remarkable waterway of the Göta Canal, which, constructed in 1809–1822 before the railway epoch in Sweden, was expected to become of great commercial importance but which now chiefly serves the summer tourist traffic.



A RURAL SCENE IN SWEDEN

Both views are from the province of Skane, which is one of the most fertile parts of Sweden where intensive cultivation of the land has been carried out. The houses are often situated in the middle of the small holdings and not concentrated in villages

Photos: Swedish Travel Bureau

Mining and Engineering. Relatively thickly-populated and rich in (according to Swedish estimate) medium-sized towns, central Sweden is also the central district of the Swedish metal and engineering industry. For this it has good qualifications, for in these regions lies the Bergslagen district (chiefly in the provinces of Värmland, Dalarna, Västmanland, parts of Gästrikland and Uppland), Sweden's oldest iron-ore territory, where mining was in progress as early as the thirteenth century at the same time as one of the world's richest copper mines (Stora Kopperberg) at Falun began to be worked.

When Sweden's share in England's iron

import sprang up to about 80 per cent at the beginning of the eighteenth century, Bergslagen was the great supplier of pig iron. There, before the era of industrialism and specialization, agriculture and mining once went hand in hand. The iron "broke ground" in Bergslagen's rugged forest tracts and created new places to settle, new communities, new life. But the many blast-furnaces and forges of that time have now been replaced by some few large ironworks—Sandviken, Avesta, Domnarvet, Fagersta, Hofors, Hagfors, Munkfors, etc.—well-ordered industrial communities, suppliers of quality-steel which has world-wide fame.

Sweden's ore resources, which may be suitably discussed in this connection, are divided among three comparatively well-defined geographical areas.

The first, to which reference has been made above, is the *central Swedish* area, described by the somewhat vaguely-defining name Bergslagen, the second is the *Lapland* iron-ore field in Norrbotten with centres in Kiruna and Gällivare, the third (discovered December, 1924) is the "Skellefte Field" around the Skellefte River on the boundary between Västerbotten

and Norrbotten, with its centre in the mining community of Boliden, which arose between the two World Wars. The ore of this district has won special fame on account of its gold content. The gold-bearing ore is of limited richness; it is for the present, however, Europe's foremost gold-mine.

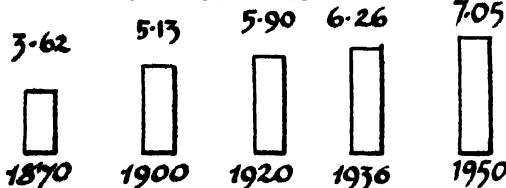
The chief mineral and metallurgical products in 1950 were as follows: iron-ore 13,611,000 tons (12,943,000 exported); steel ingots and castings 1,436,000 tons; pig iron 784,700 tons; zinc ore 63,600 tons; gold ore 72,300 tons; silver and lead ore 29,000 tons. Workers in the mining and metal industries numbered more than 60,000.

It is estimated that the Boliden ore will be worked-out before very long, but reserves of ore are to be found in the neighbourhood of Boliden, and good hope is entertained of the discovery of further resources. Of these iron-ore fields the first-named serves also the home iron industry, whilst the Lapland field, which is considered to be one of the richest in the world, is availed entirely for export purposes. Should the Bergslagen ores be too heavily drawn upon, Sweden has here a reserve to cover its own need of ore.

SWEDEN

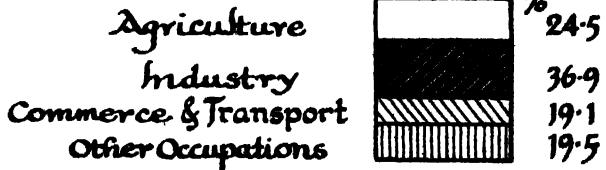
POPULATION

in millions



Occupational Distribution

in percentages of total number of persons gainfully employed



PRODUCTION

in millions of metric tons

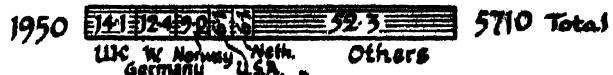
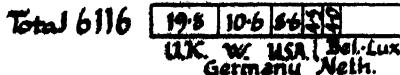


FOREIGN TRADE

by Countries

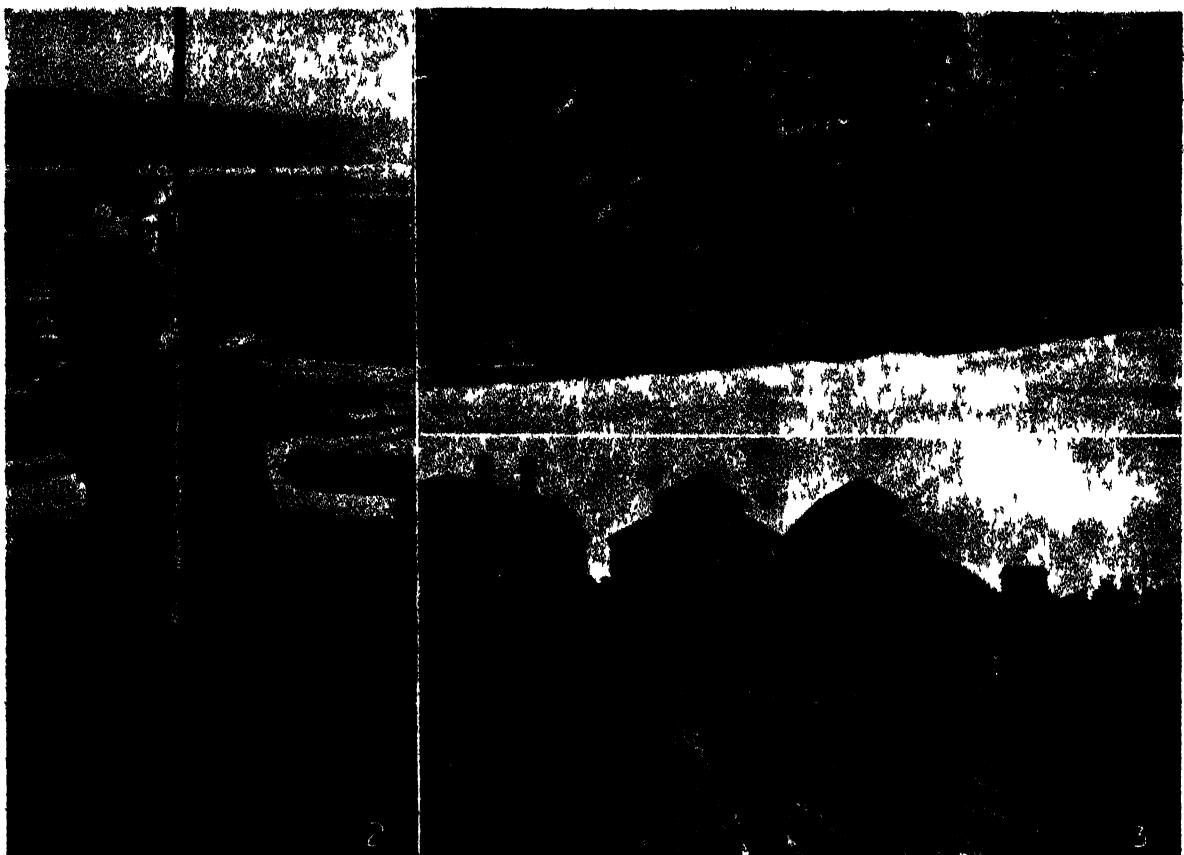
IMPORTS

in percentages of Totals of millions of Kroner



EXPORTS

Total



THE TIMBER TRADE OF SWEDEN

1 Transporting lumber 2 Floating logs down a river 3 Saw mills
Photos Swedish Travel Bureau, Timber Development Association

Coal resources are meagre and the coal mined of poor quality. Some 7,000,000 tons of coal and coke have to be imported annually.

Forest Lands. North of Lake Vaner in Värmland the majestic lines of the Norrland landscape character are already brought to mind. The deciduous groves become more and more rare, lofty pine-clad heights line the horizon with blue, the river valleys become more and more deep and wide, and sometimes broaden out into long narrow lakes, such as the Fryken Lakes, of which Värmland's own poet, Selma Lagerlöf, has sung.

In these districts the towns and communities do not lie so closely together: the distances between villages and farms grow greater and greater. Thus stretches the immense, quiet, thinly-populated forest land in a broad belt between the mountains in the west and the coastal plains along the Gulf of Bothnia in the east, as far as from Värmland in the south to the border of Finland in the farthest north, broken in the main only by the open

and fertile agricultural country around Lake Storsjö in Jämtland, by the great, desolate marshes in Lapland, but primarily by the broad, cultivated river valleys through which the rivers of Norrland flow into the Bothnian Gulf.

In the whole of Norrland the land which has been laid under cultivation follows the river valleys like narrow ribbons, and only on the coast does it expand into wider settled tracts. There, at the river-mouths, the nineteenth century sawmills were established, and there too lie their modern successors, the wood-pulp factories.

During the short, light summer, corn, autumn rye and potatoes all ripen on the flat river valleys, and splendid herds of cattle find good pasture in the succulent meadows. The agriculture of Norrland has admirably utilized the natural potentialities and, defying a hard climate, has created conditions for giving nourishment not only to the agricultural population but also to the timber-industry workers.



STACKING CHOPPED WOOD

The piles are typical of Skane province, and can be seen close to every cottage and every farm

Photo Swedish Travel Bureau

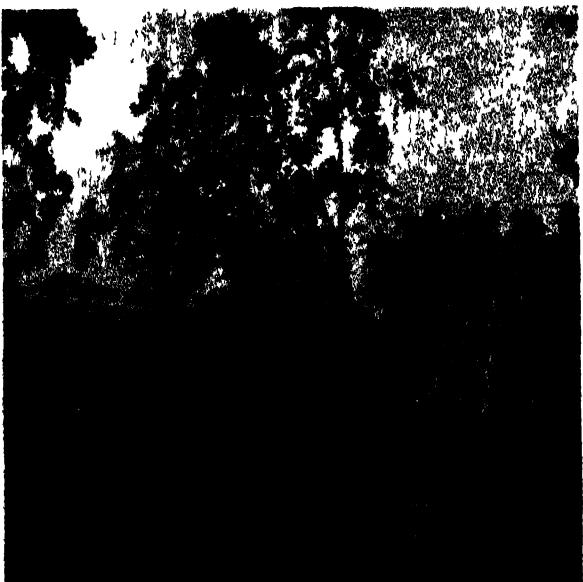
and their families. North Norrland's most important towns, Sundsvall, situated between the mouths of the Indal River and the Ljunga River, and Härnösand, situated on the estuary of the Ångerman River, are surrounded by a thickly-populated timber-industry district, where the density of population rises in certain tracts to that of Scania, and where thriving industrial communities have attained a social standard which would have been unthinkable without the exploitation of the great forests. The Lapland iron-ore fields have played the same type of social role.

Timber Resources. The north Swedish pine-wood belt can be regarded as one of the most important forest areas in the world. Thence comes the greater part of Sweden's export of forest products. Forest covers 52·2 per cent of the land area, whilst in England—the most important market for Swedish forest products—forest occupies merely 4·6 per cent of the whole.

The size of the timber supply and the growth of the forests is of vital interest to Sweden's economic position. Through the National Forest Survey undertaken during 1923–1929, which was afterwards taken as a pattern by several countries, and which involved a complete stocktaking of all Swedish forests, it could be declared with certainty that the timber resources and the increase in growth of the country's forests were greater than had been hoped. It should be added that Sweden's forest industry is not confined to Norrland, although its greatest economic importance is situated there, as forestry and timber transportation provide the small farmers with good opportunities to make additions to their incomes.

The short and relatively small rivers of Norrland are of enormous importance to the forest industry. Only a few are navigable to any noteworthy extent, but it is by them that the riches of the mighty inland woods are floated down to the coast. The total length of the waterways used for floating timber exceeds 32,000 kilometres, or nearly twice the total length of all Swedish railways. From the thinly-populated forest districts the timber floats with the stream down to the sawmills, the pulp and cellulose factories on the coast. In the forestry of south and central Sweden, which has not the same large-scale industrial character as that of Norrland, the water-current is being replaced to a greater and greater extent by motor lorries.

The resources of iron-ore and timber form the foundation for Sweden's greatest export industries, and of these the forest industry is to-day the foremost. During normal years it represents approximately 50 per cent of the total annual export values. The export of sawn-wood goods is admittedly on the decline but is being compensated by a rising export of paper-pulp. The new and flourishing artificial silk industry is also of great interest to the export trade, as Sweden supplies a considerable part of the raw material for the industry—approximately one-third of the world requirements. The timber industry in Värmland has especially concentrated upon the manufacture of this kind of pulp.



A LAPPE TENT IN NORTHERN SWEDEN

Photo: Swedish Travel Bureau

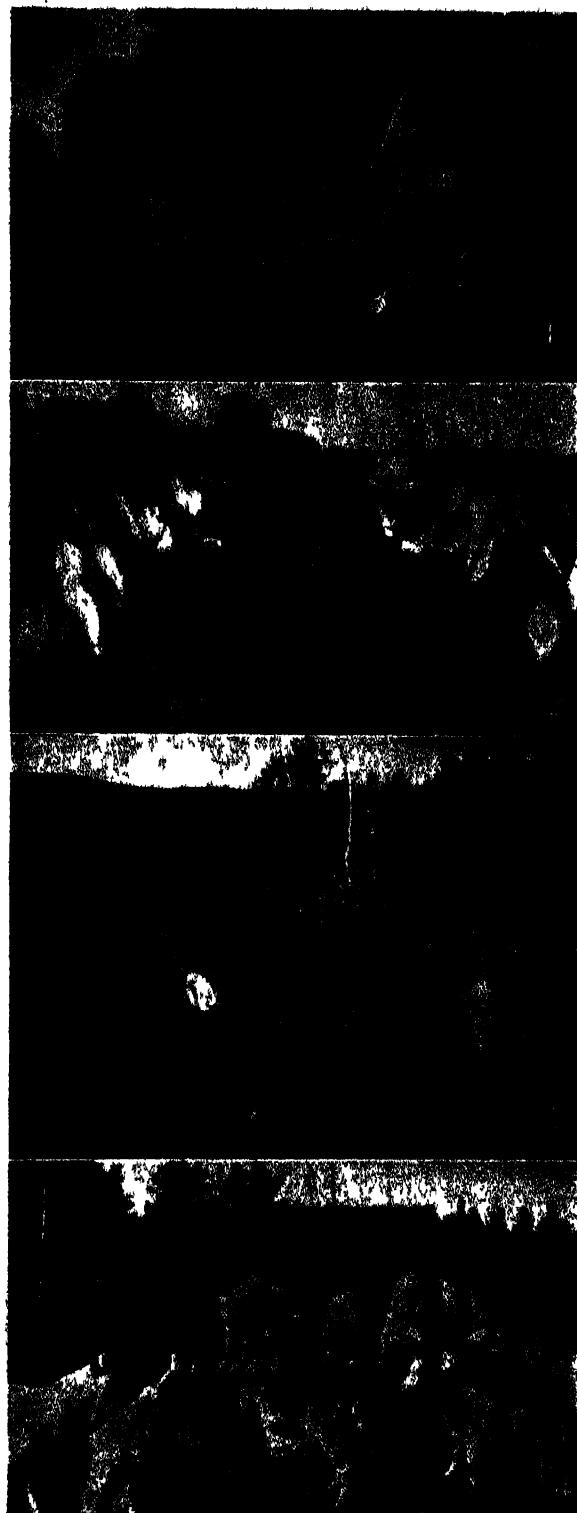
Water Power. Sweden is practically lacking in fossil fuel, for the Scanian coal-fields (from the Rhaetic—Liassic period) are of no particular importance. The sources of energy lying in the waterfalls on the Swedish rivers—75 per cent of the water power is concentrated in Norrland—is, therefore, a national asset of incalculable worth. Although it is estimated that hardly more than one-tenth of the available power has been harnessed the entire country is well supplied with electricity.

Increased use of electrical energy in industry and agriculture, and for communications and domestic purposes, has demanded the establishment of new power stations. The Trollhättte power station—completed in 1910—admittedly spoiled the romantic vista of the famous Trollhättte Falls on the Göta River, but in return provided light and power for the whole of west Sweden. To-day it also drives the electric trains on the Goteborg—Stockholm State Railway. During latter years the other main lines of the State Railways have also been electrified.

The exploitation of the Trollhättte Falls has been followed by the establishment of a whole series of new power stations in various parts of the country. In Lapland, for example, the power station at Porjus on the Lule River drives the heavy ore-trains on the Riksgräns, or Frontier, Railway between Luleå and Narvik. In the near future the power generated in Norrland will be utilized more and more by means of transmission in the remainder of Sweden, in such a way that during the summer the low-water periods in south and central Sweden will be counterbalanced by the then relatively abundant volume of water in the Norrland rivers. Through the melting of the snow on the highest mountain plateaux the rivers there run high during the summer.

Nineteenth Century Changes. Up to the end of the nineteenth century agriculture was the chief source of Sweden's livelihood. About the middle of the century 75 per cent of the population still derived their living from the soil. The general agrarian depression in Europe during the 1880's, chiefly occasioned by the entry of the cheap American wheat upon the European markets, affected Swedish agriculture also. The export of grain ceased and was replaced by a growing import. Land values declined. Thereafter Swedish agriculture more and more specialized and concentrated upon live stock production and dairy products.

The growing industrial population (15 per cent in 1870, 37 per cent in 1950), which has



SCENES OF SWEDISH RURAL LIFE

1. A mill near Lund.
2. On an experimental seed station; crossing beet sugar plants to evolve better types.
3. A harvesting scene.
4. A goat farm.

Photos: Swedish Travel Bureau



THE WALLS OF VISBY

Visby, "city of ruins and roses," is one of the old Hanseatic strongholds. Its walls now shelter numerous small houses built against the sides.

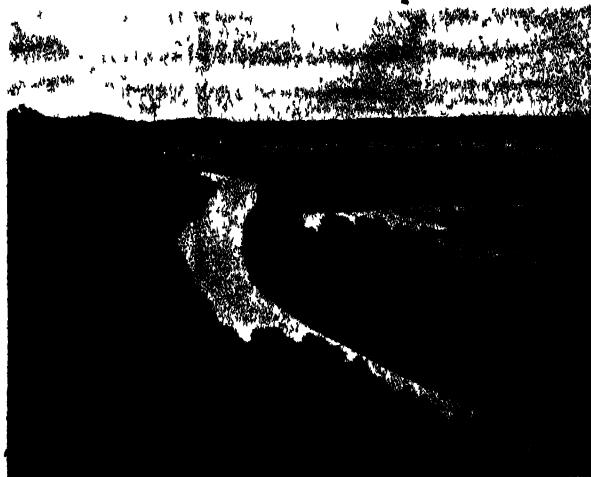
Photo Swedish Travel Bureau

been able to enjoy a continually improving standard of living, has occasioned an increased demand for meat, milk, butter, etc., and simultaneously such products have found a market abroad, especially in England. As regards grain production it can be stated that during latter years wheat cultivation has strongly increased, favoured by the State through the *milling decree*, i.e. the obligation of the flour-mills to use a high percentage of Swedish wheat in their milling operations. Seed-selection, pursued primarily by the Svalöv Experimental Station in Scania, has created hardier and more productive wheat varieties, whereby the yield per hectare has been greatly increased.

Between 1820 and 1870 was the great period of agricultural expansion in Sweden. During this half-century no fewer than 1,700,000 hectares of land were brought under cultivation and large areas of arable land were reclaimed by draining marshland and sinking the level of the lakes. The mighty development which took place would not have been possible without a land partition reform—the so-called "*laga skifte*" or legal enclosure—commenced on the initiative of the State in 1827. Through this reform the small field-plots were united into large units, the farms clustered together in villages on the agricultural plains were compelled to move out and spread themselves over the properties, and the common grazing lands were divided among the individual farm units. In this way individual initiative, formerly

bound by old-fashioned wonts and farming methods in the village communities, was liberated in really revolutionary fashion. The reform, which can be most nearly compared with the Enclosure Acts in England, has also completely remodelled the aspect of the Swedish countryside, which thereafter obtained its character of scattered settlement. Large villages are now to be found only in Dalarna and Upper Norrland, but the bygone historically-interesting peasant culture from the village-community period can best be studied at Skansen and the Northern Museum in Stockholm.

Improving Communications. The New Age in the social conditions of agriculture may be characterized primarily by the "*Egnahemsrörelse*," or "Own-Homes Movement," i.e. the creation of small agricultural holdings, subsidized by State loans. Special interest attaches to the progress being made in this way in the forest regions and marsh-lands of Norrland, where many roads have recently been cut through the great wastes. In Norrland also, in 1937, the last link was coupled in the long railway line from Kristinehamn by Lake Vaner to Gällivare in Lapland which, under the name of the Inland Line, was intended to be a "culture route" for the inner regions of the northern forest territories. The final extension of the Swedish railway network can thereby be considered completed, though much still remains to be electrified. Future development of the communications system belongs to the roads, which, in Sweden as in other countries, are being reconstructed and modernized. Sweden



GÖTA CANAL

Built before the railway era, it now chiefly serves tourist traffic

Photo: Swedish Travel Bureau



A HERD OF REINDEER

The reindeer is invaluable as a staple food, beast of burden, and means of transport. This herd is being driven "home" across the snowfields of Jämtland.

Photo Swedish Travel Bureau

has not gone in for *autostrades*, but has excellent automobile roads which have been continuously improved. The number of concessioned omnibus lines runs into several thousand and in actual fact it is now possible to travel from Scania in the south to Karesuando in northernmost Sweden by the use of bus-lines alone.

The forests, the iron-ore, the farm-land and the waterfalls are Sweden's great natural resources. The very primitive rock is also utilized in the stone-yards of Bohus and Blekinge, but this industry has been severely affected by the decreased demand for hewn stone abroad. Of greater value is the Cambrian-Silurian bedrock which appears in parts of Väster- and Östergötland, in Närke, upon Öland and Gotland, and in several other places. It provides building stone, cement and lime for the use of industry and agriculture. The cement industry is the only more important industry on Gotland, and, together with lime, plays a most vital part in the island's exports. Gotland's surplus of food products (sugar, malt, potatoes, eggs, meat, fish, etc.) are also turned to good account on the mainland and particularly in Stockholm. As an example of agricultural specialization it may be mentioned that the island's sandy soils have revealed

themselves specially suitable for asparagus cultivation. About one-half of Sweden's demand for asparagus is to-day supplied from Gotland.

Sweden's long coastline—7624 kilometres to be exact—has meant that sea-fishing has always been of great importance to the nation's livelihood. Of greatest importance is the herring fishery carried on from the Göteborg and Bohus Province, and also the *strömming*, or Baltic herring, fishery in the Baltic. Only in Bohus Province, however, has fishing given rise to larger, independent communities, fishing villages, the inhabitants of which derive their incomes solely from the fisheries carried on in the Kattegat, Skagerrack and the North Sea. The fishing villages situated on the bleak primitive rocks in the seaward skerries, with their closely clustering houses, are perhaps the most unique and picturesque types of buildings now remaining in Sweden.

As a "natural resource" of certainly not so great a quantitative as a qualitative value, the Swedish race itself may also, in conclusion, be considered. It is an unusually homogeneous national, cultural and ethnographical unit. The relatively few foreign elements in the nation are provided by the Finnish-speaking



LOCAL INDUSTRIES OF SWEDEN

Left. Drying fish at Möltsund on the west coast of Sweden. *Right:* Charcoal ricks in a northern forest
Photos: Swedish Travel Bureau.

population in northern Lapland on the border of Finland and the Lapps, the primitive inhabitants of Lapland, who are now to an increasing extent abandoning nomadism and reindeer-raising. The number of reindeer belonging to the Lapps amounted in 1939 to approximately 260,000, of which about 30,000 were in Jämtland, with Härgedalen the southernmost province where nomad Lapps appear, but this total has now been halved.

Stockholm. The capital city had 745,900 inhabitants within its administrative boundaries during 1950, but if the geographical Stockholm with suburbs and outlying communities is reckoned, the population of *Greater Stockholm* is now approximately 1,101,400, or about one-seventh of the entire national population. Immigration from the country provinces plays a decisive part in the development of the city's population, which increases at present by about 10,000–15,000 persons yearly. As a result of this great invasion building activity has been unusually lively, and the city has grown considerably beyond the boundaries it possessed only a decade ago. Large suburbs, laid out as garden cities, have arisen (Äppelviken, Ålstens, Nockeby, Ängby, etc.) and municipally-subsidized "small cottages" (*smdstugebyggen*) chiefly intended for workers (Enskede, Södra Ängby, etc.) form a typical element in the outer districts.

Stockholm is the largest industrial town in terms of the number of workers employed in industry and handicrafts, the majority in the metal, paper, printing and food industries. But it is primarily as an administrative, com-

mercial, cultural and artistic centre that the city is of importance.

As the industries are mostly placed on the outskirts, Stockholm is a remarkably clean and neat city, with a healthy, open position on the border between the archipelagoes of the Malar Lake and the sea. The woods or the moderately disciplined parkland (*Djurgården*) touch the very corners of the city, and the great international tourist steamers on their Baltic cruises can pass through the beautiful archipelago and up the Stockholm Stream (*Strömmen*, the outlet of Lake Mälar) direct into the heart of the city. Stockholm's "Old City" is the medieval Stockholm (*Staden mellan broarna*, "the city between the bridges"), built on a small island in the Stream, where narrow streets and alleys still call to mind the time—about A.D. 1250—when Birger Jarl founded a town by the gateway to Lake Mälar's rich hinterland. In this part of the city lie the distinguished Royal Palace, erected at the beginning of the eighteenth century in French-Classical style by N. Tessin, the House of Nobles, in Dutch Baroque, where the Swedish nobility held their first meeting in 1657, and the Riddarholm Church, originally a monastery church belonging to the Franciscan Order, but since the seventeenth century dedicated as the sepulchre church of the Swedish Kings.

During that century the city was rapidly developed as the capital of a Swedish Great-Power Baltic Empire; a splendid town-plan on renaissance lines was evolved and became decisive for the building of the city, which now grew over Stadsholmen and the surrounding

islets and mainland to the north and south (the quarters of Södermalm, Norrmalm, Östermalm, and Kungsholmen). The suburban development has been particularly westward to Lake Mälaren's pine-clad shores, where Bromma parish was incorporated in 1915. At Bromma lies the city's aerodrome, inaugurated for traffic in 1936, since when London, for example, has been brought within a few hours' journey from Stockholm. The 1920's represent the emergence of the modern epoch in the history of the city, manifested by the City Hall, completed in 1923—a creation of Ragnar Östberg and inaugurated on the 400th anniversary of the very midsummer day Gustav Vasa marched into the city.

Other Cities. Besides Stockholm only two cities in Sweden can claim a population of more than 100,000. They are Göteborg (Gothenburg), founded by King Gustavus Adolphus the Great, the important export harbour for Bergslagen and western Sweden and the home of the Swedish steamers plying with England and America; and Malmö, the metropolis of Scania and Sweden's port of exit to the Continent.

In addition to these larger cities, Sweden has several provincial centres of great cultural or economic influence. Among the former are the university cities of Uppsala and Lund—the former being also the seat of the Archbishop. Among the latter may be named Norrköping and Borås, centres of the textile industry in eastern and western Sweden respectively; Gävle, South Norrland's and one of Bergslagen's export harbours; Helsingborg, after Malmö Scania's largest industrial town (rubber commodities); Västerås, the centre of Sweden's electro-technical industry; Eskilstuna, famed for its steel-ware; Örebro, the "shoe town," where the first King of the Bernadotte dynasty

was elected in 1810 as successor to the Swedish Throne; Jönköping, the "match town," and several other towns with more or less pronounced specialities.

Amongst other towns which have played a prominent role in Swedish history the wall-girdled Hanseatic city of Visby on Gotland takes a special place as the Mistress of the Baltic and the centre of north European commerce during the early Middle Ages. The same epoch marked the period of prosperity of the



THE CITIES OF SWEDEN

Above. Part of the harbour of Malmö, one of the most important in the country
Below Stockholm. The ingenious traffic circus in the foreground is the main entrance to the city from the south

Photos. Swedish Travel Bureau

largest town on the coast of Småland, Kalmar, a lively medieval mercantile town upon the former trade route to Gothland, and seat of a renowned castle. A similar place is taken on

the west coast by the town of Halmstad, in Halland, an important frontier fortress during the Scandinavian Union period in the fifteenth century.

Iceland

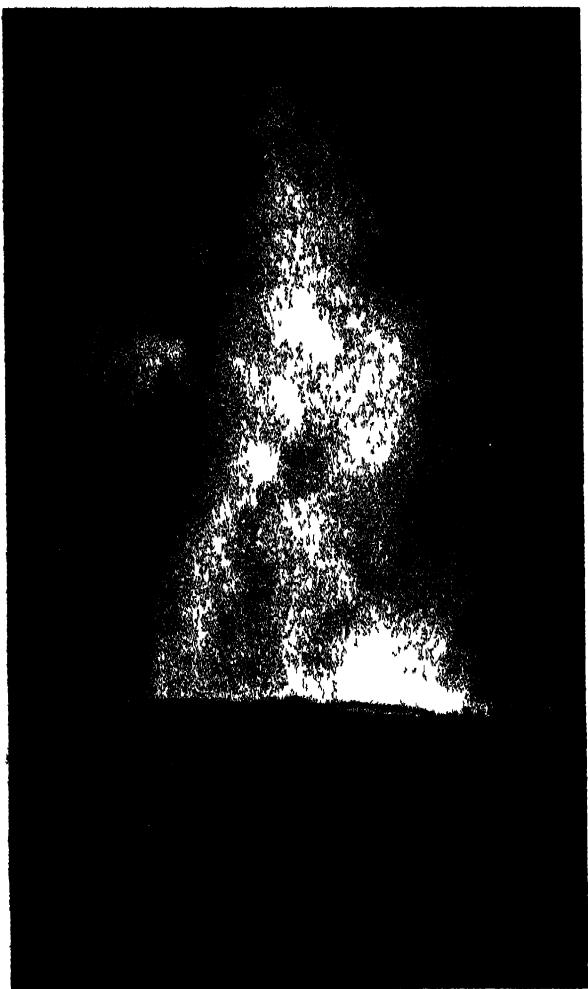
IN spite of its position, farther north than the south of Greenland, Iceland cannot be regarded as an Arctic land. More of its coasts are washed by Atlantic than by Arctic currents, its climate is more temperate than polar, and its people, civilization and economy are European. But its isolation and peculiar

features have made it a state of marked individuality: it resembles no other land.

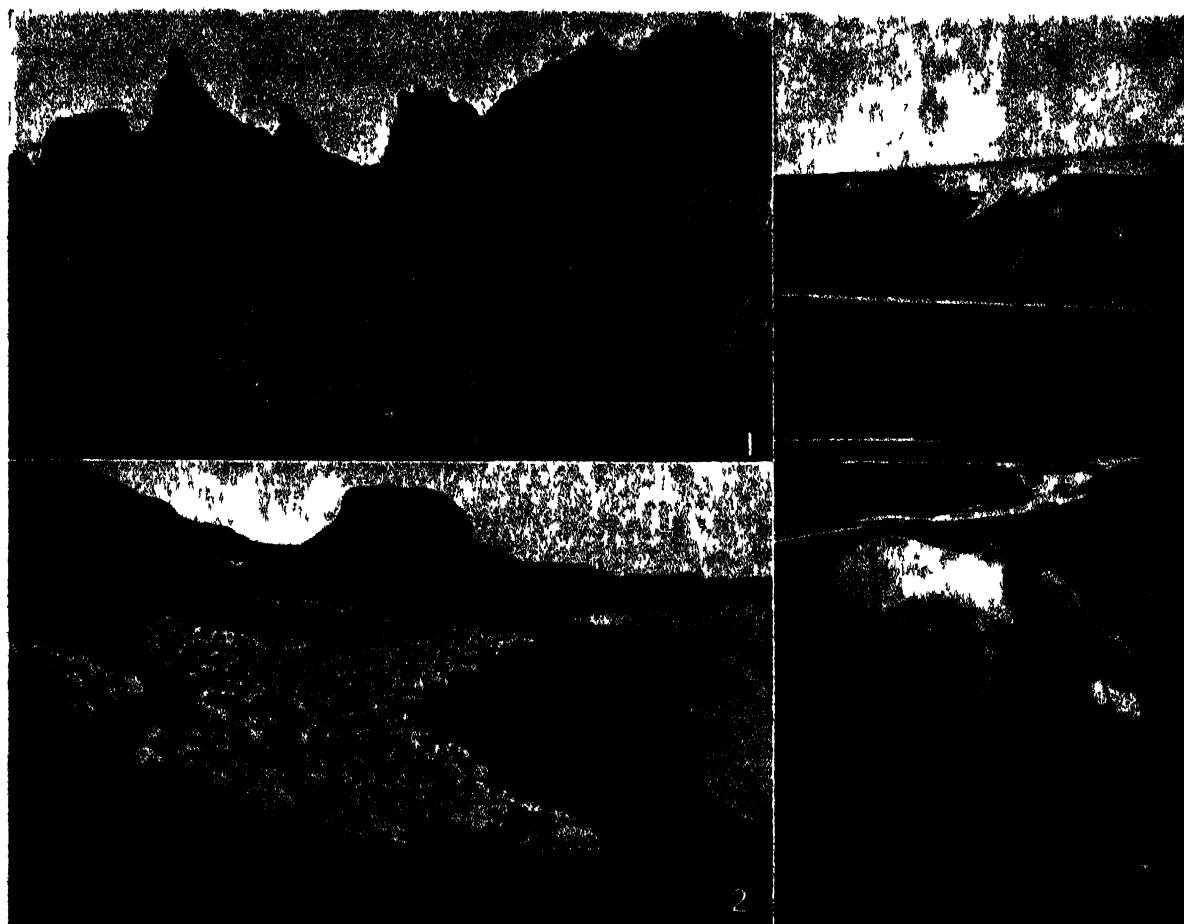
In the main it is a high level plateau, some 2000 feet in height, of volcanic rocks cut by long deep fjords and with very little lowland except in the south and south-west where rivers have built small alluvial plains. Ice and volcanoes have given Iceland its features and determined its value to man. Of the ice-sheet that covered the land during the Ice Age there remains only about 5000 square miles, of which the largest part is the great Vatna Jökull, of 3400 square miles in extent. Here is the summit of Iceland, 6240 feet above sea-level. Other smaller ice-fields are Lang Jökull and Hofs Jökull.

Volcanoes and Hot Springs. From the snowfields and glaciers many turbulent rivers tumble down the plateau edge to the sea: some of them with striking waterfalls such as Dettifoss, about 300 feet, and Gullfoss, sixty feet. Where the snow and ice have gone, volcanoes have altered the surface features. There are about 100 of these, of which some twenty-five have been active in historical times: Hekla, Katla and Askja, with its huge crater, are the best known.

The most terrible eruption of many recorded in Icelandic history was that of Skaptar Jökull in 1783. Subterranean rumblings heralded the disaster. First melting snow poured in torrents over the land, and then came lava streams, one of them twelve miles wide and over fifty miles in length, another seven miles wide. They flowed in places in river valleys and in places spread over the plateau, while the whole island was deluged with ashes and dust. Even the Faeroes and the Shetland Islands received some of the ash. Loss of life was great, thousands of cattle were killed and shoals of sea-fish were poisoned. In recent years the volcanoes have been quiet but there is no hope that they are all extinct. Earthquakes are not infrequent and other volcanic manifestations are the hot



THE GREAT GEYSER IN ERUPTION
Photo: Ol. Magnusson, courtesy "Statesman"



THE ICELAND SCENE

1. Typical lava formation. 2. Sheep being driven from the hills to the plain in autumn. 3. An Icelandic pony against a background of bleak moor and snow-covered mountain

Photos: Ol. Magnusson, courtesy "Statourist"

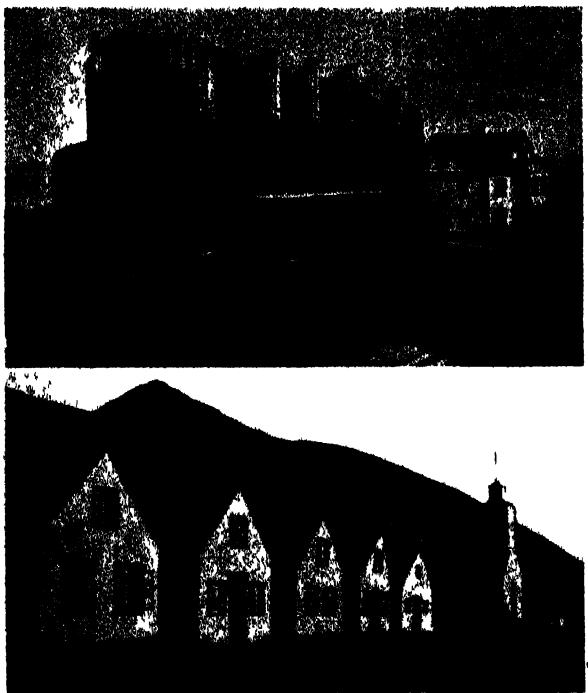
springs of which the most famous is the Great Geyser itself. In some cases hot springs have been utilized for domestic purposes. Great Geyser is intermittent in its eruptions and every few days ejects boiling water to a height of over 100 feet. After some years of quiescence it has now started again. Many other volcanic features are famous, such as Almannagja, a colossal mile-long gully flanked by walls of 100 feet or more, and the well-known caves of Turtur.

The main result, however, of all this volcanic action is the presence of vast lava-covered areas, none of which is of much value to man, rugged and often lifeless like the remarkable Odadahraun, lying north of the Vatna Jökull. All the interior is wild, rugged and unproductive, covered where vegetation occurs with moss, moor and grass, with a few small woods of stunted birch and occasional rowans. Trees may have been more numerous in the past but

there never were forests of any height and density. Iceland was one of the last homes of the now extinct Great Auk, a bird that stood three feet high and had its wings reduced, as in the penguins, to mere flippers.

Climate. The climate is warmer than the latitude would suggest, for the tempering influences of Atlantic currents are felt. Winter is long, wet and stormy, but the snow does not lie long around the coasts and few harbours in the west and south are impeded by ice. On the north coast cold currents may bring pack-ice and Arctic conditions for a time. The summer is mild and less wet, but snowstorms may occur on high ground. The proximity of Iceland to the North Atlantic low pressure system and its moving depressions gives the key to its weather.

The Coming of the Vikings. Into this grim and unpeopled land came the Vikings in



CONTRASTS IN ARCHITECTURE

Above: The National Theatre at Reykjavik Below: Typical old style farmhouses

Photos OI. Magnusson, courtesy "Stalourist"

the ninth century. If there were any previous inhabitants they were only a few Celtic-speaking people from Ireland; but this is doubtful. The colonization of Iceland by the Norsemen was slow. In the thirteenth century, however, the republic was important enough to be attached to Norway after fifty years of independence; but then began a long series of calamities and trials which tested the fibre of the sturdy Icelanders.

After the Black Death, which in 1402 took two-thirds of the population, came centuries of periodical raids on the coasts, an epidemic of virulent smallpox, and frequent devastating volcanic eruptions followed often by famine, all of which were intensified in their calamitous effects by the heavy hand of Denmark, the inheritor in 1381 of Norwegian sovereignty, in its stringent trade monopoly. Not until the nineteenth century was well advanced did Iceland begin to recover, as the people slowly reached their independence.

To-day Iceland has no tie with Denmark. In 1944, during the German occupation of Denmark, the Act of Union of 1918 was repealed and a new constitution was proclaimed.

The People and Their Activities. Conditions in Iceland give little scope for population. About six-sevenths of Iceland is unproductive, and the population of 144,300 lives round the edge of the plateau.

Agriculture and fishing are the two occupations of the people. But agriculture is limited in its scope: no kind of cereal will grow and there are no ploughed fields. Beyond a few small patches of turnips and potatoes and a fenced field or two of hay, an Icelandic farm has open pastures for sheep, cattle and horses. The farm, which of old was a primitive hut of timber, stone and turf, is now a well-built timber dwelling with ample barns and out-houses. Tracks join the farms, though motor roads are now being built and the motor is slowly replacing the beast of burden.

Distinctive hardy breeds of sheep and horses have been evolved and there is much export of horses and a growing export of wool, salted and even frozen mutton, and some butter. The cattle feed is good and is now being improved by fish manure made locally, as well as by imported fertilizers; but the milk supply is inadequate and is supplemented by tinned imports. There was a time when all the wool was spun and woven on the farms, but now most of it is exported to Denmark and the United States of America, and there are only two woollen mills; these use water power.

Efforts are being made to reclaim waste land, for much has been destroyed by cutting brushwood and overgrazing which have led to soil erosion and the destruction of pastures. But the task is difficult and calls for great effort. About half the total population is engaged in agriculture, a decrease compared with the number so employed half a century ago, in spite of the increased prosperity of the farmers.

The fishing occupation flourishes but has many difficulties to face, although the fishing grounds are near at hand. Concentration on "white" fishing from steam and motor boats entails import of fuel, export of products and the use of a few good ports to the neglect of the tiny havens. Thus the old two-fold life of fisher and farmer has given way to the exclusive pursuit of one or the other. Cod, to be dried or salted or to be used for oil, is the chief catch, but in the season herrings also are important. The cod fishery is valued at about 160,000,000 kroner and the herring fishery at about 40,000,000 kroner annually.

Iceland's prosperity in trade depends upon

the price of her fish in European markets. Catholic states such as Spain used to buy a great deal: now their falling demand is a serious blow to Iceland. It was largely Spain's insistence on Iceland's acceptance of imported wines that led to the failure of total prohibition which, after having been the rule since 1915, was repealed in 1922.

Whaling has much declined on account of competition from the lucrative waters of the Southern Ocean.

Manufactures are handicapped by lack of fuel, except a poor peat, and of raw material except wool, some spar, and sulphur which is no longer mined. On the other hand water power is abundant and suggests the possibility of electro-chemical industries such as the manufacture of nitrates. Electricity might also supplant imported coal for domestic purposes.

There are no railways, but all the towns and villages are connected by motor buses. An Icelandic Steamship Company maintains regu-

lar services with Hull, Leith and Kjöbenhavn (Copenhagen). Not until 1906 was Iceland linked to Europe by cable, but now the telegraph and telephone are universal.

The Capital City. The only town is the capital, Reykjavik, which has grown from a village of 300 inhabitants a century ago to a town of some 56,000. Much of it is still built of wood and corrugated iron, but concrete is being increasingly used. A fine new harbour has been built, and there are hotels, cinemas and the usual amenities of a European town. A university was founded in 1911 and there are several secondary and vocational schools and a National Library. The town supports daily and weekly newspapers and journals.

The other "towns," such as Akureyi (7500), Hafnarfjördur (5000) and Vestmannaeyjar (3700) on the Westmann Islands, and a few others are the only large villages, still a little primitive and interested chiefly in fishing.

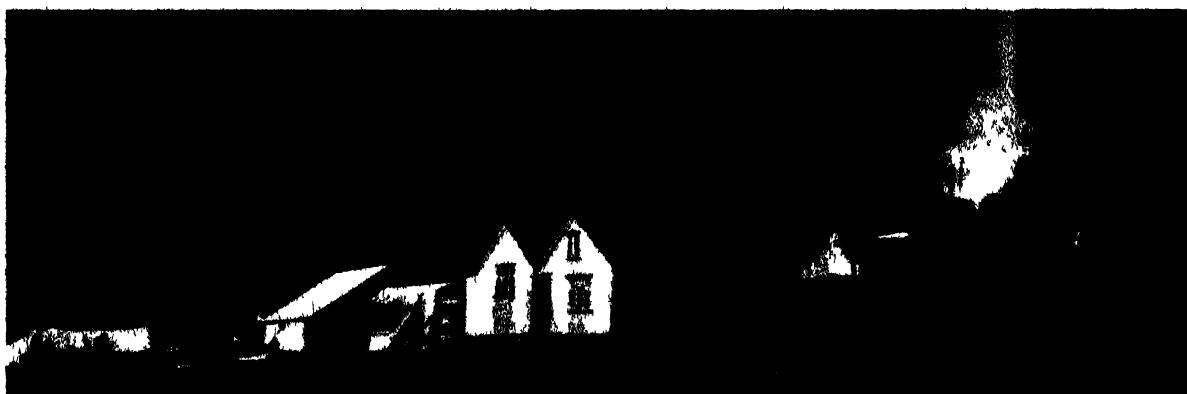
Fish is the staple food of the Icelanders and,



REYKJAVIK

The capital of Iceland

Photo: Ol. Magnusson, courtesy "Statensit"



AN OLD FARM HOUSE NESTLING UNDER A CLIFF IN ICELAND

Photo: Ol Magnusson, courtesy "Statesman"

mutton the only meat. Potatoes are the only common vegetable and fruit, except the bilberry, is scarce. Coffee and milk are the usual drinks, although after a brief trial Iceland has abolished prohibition. The people are mainly Lutherans. Their language is allied to old Norwegian but a good deal of English is spoken in Reykjavik and even in the scattered farms.

The growing national prosperity of Iceland shows itself in the increase of population and the diminishing emigration to the United States of America. With roads, cars, cinemas,

telephone and wireless, isolation is being overcome, the standard of living raised, schooling improved and outlook widened. And yet it is doubtful if the Icelanders can still claim, as they could of old, to be the most cultured people in Europe. The whirlwind of modern life is undermining the old reflective calm and philosophic outlook. London is a mere five hours' journey by air. Even labour troubles have made a start. But in one respect Iceland remains a happy land: it spends nothing on army, navy or fortifications.

The Faeroe Islands

THE Faeroe Islands are a group of twenty-two in the North Sea, with a land area of 540 square miles, lying about 200 miles northwest of the Shetland Islands. They belong to Denmark. Seventeen of the islands are inhabited.

Coasts are steep and deeply indented, while the interiors are mountainous, but deeply cut by river valleys. In the channels between the islands there are several good bays. There are a few lakes in which trout are found. The largest lake is Sorvæg, on Vaaðøe. The chief islands are Stromøe, Suderøe, Borøe, Viderøe, Osterøe, Vaaðøe, Sandøe, Syderøe. The highest peak is Slattaretindur.

Among minerals the chief are fine opals and coal, the latter being found specially in Syderøe. There is little timber on the islands, but successful attempts have been made to intro-

duce conifers, maple, and mountain ash. Peat is abundant.

The rocky surface makes ploughing difficult, but barley is cultivated and turnips and potatoes yield good crops. The climate is particularly mild, sheep and cattle requiring no housing. Sheep rearing predominates. Seafowl are numerous and a considerable trade is done in their feathers.

The people, of Norse descent, are robust and healthy; their spoken language is a dialect of the North German, but their written language is Danish. Most of them are employed in the fisheries and in the preparation of wool. Dried fish is exported in quantities.

Thorshavn, on the south coast of Stromøe, is the capital and the only town. Its chief activity, apart from the fish industry, is the manufacture of carpets.

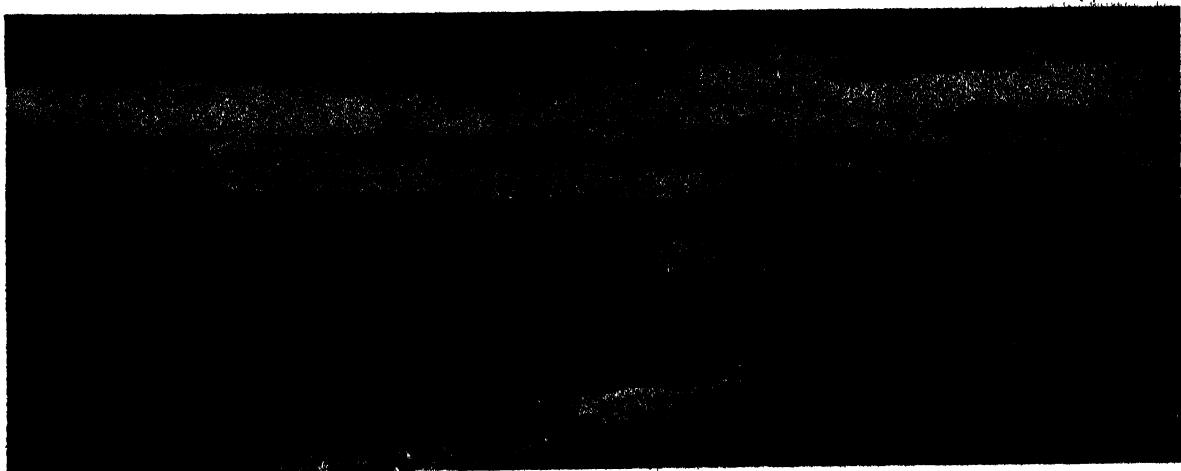
FINLAND

FINLAND is a Baltic country, situated in the centre of northern Europe on the neck of land connecting the Scandinavian countries with the mainland. In 1939 after the start of the European War, Russia made territorial demands to Finland which Finland refused. Russia invaded the country and after a short but sharp struggle a Treaty was signed in 1940. Under this Treaty, Finland lost the Rybachi peninsula in the north, the Karelian isthmus in the south, including Viipuri and the shores of Lake Ladoga, and gave Russia a thirty years lease of the port of Hangö and the neighbouring mainland. This totalled an area of approximately 16,170 square miles. When Germany attacked Russia in 1941, Finland joined Germany and took an active part in the fighting. In 1944, however, Finland was again defeated by Russia. Under the ensuing Peace Treaty the total area ceded to Russia was increased to 17,596 square miles. Finland was thus left with an area of 130,162 square miles and with no direct access to the Arctic Ocean. The population of the country in 1950 was approximately 4,033,000.

The Lakes. The Ice Age, during which the country was covered by mainland ice, is

one of the factors of the barrenness of the country to-day; its heritage of nearly 70,000 inland lakes, to-day one of the principal charms of Finnish landscape, accounts for about a tenth of the total area. In the Central District, where these lakes are most numerous, they form, with the assistance of cleverly constructed canals, a system of inland waterways, which plays an important part in the economic life of the country, providing a cheap method of transport for timber, which can be floated along these waters for hundreds of miles. There are in all some 3000 miles of such navigable watercourses, which can be divided into three: the eastern course winds its way to Lake Ladoga, the central to the Gulf of Finland, while the western ends in the Gulf of Bothnia.

Scenery. Of the land, nearly three-quarters is covered with forest, and this vast resource of natural wealth has become the mainstay of Finland's economic life. The country is generally low-lying. There are occasional mountains in Finnish Lapland, the northernmost part of the country, and also in the north-west. The highest is Haltiatunturi, over 4000 feet high. But to say the country is



LAKE KILPESJÄRVI

A typical scene in the north-western part of Finnish Lapland

Photo: Finnish Legation



WATER POWER
The great dam at the Imatra Rapids
Photo: Finnish Legation

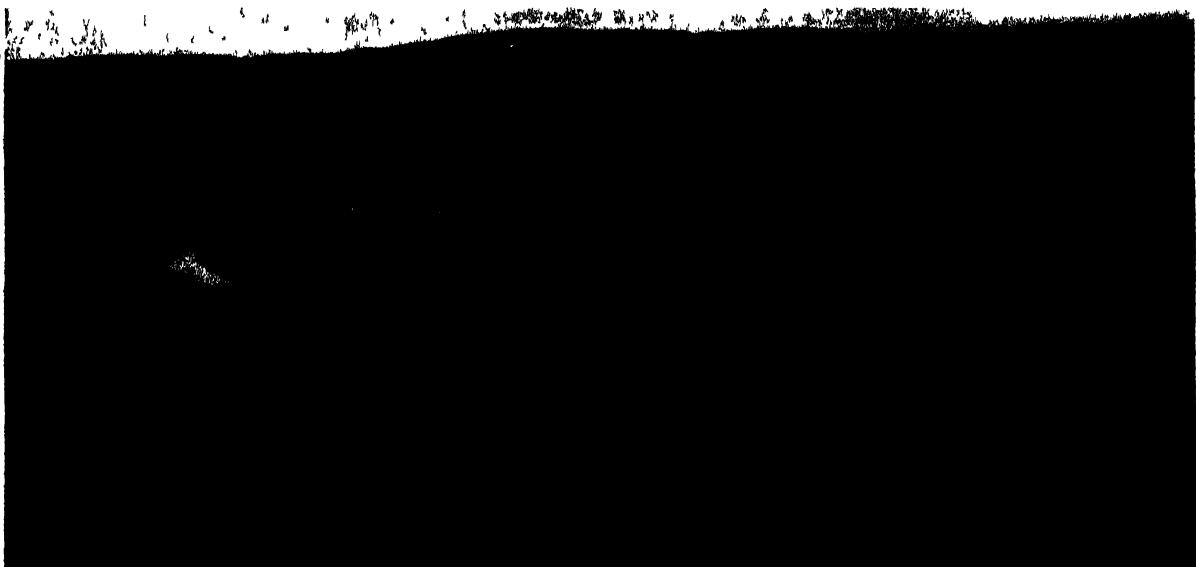
low-lying is not to suggest that the landscape is dull or flat; actually, hills, ridges, basins and valleys, the multitude of islands both in the lakes and along the rugged coast line, a profusion of rocky bays and a variety of forest rising everywhere from the rocky ground, make the country constantly varied, sometimes majestic, and always charming.

In the south and near Lake Ladoga the scenery is more austere than in the north: the naked rocks rise sheer over the lakes and

afford magnificent views of water and forest in the solitude around. Except in parts of the south, where, in the long valleys formed by the two rivers Lapuanjoki and Kyrunjoki, endless expanses of meadowland stretch uninterrupted, forest dominates the entire landscape.

In between the forests and upon their fringes lies the cultivated land. The forests are mainly pine, though spruce and alder and the typically northern birch are also plentiful. Much of the forest, especially in the north, is, however, unproductive, being covered with swamps, and it is estimated that these unproductive swamps account for one-third of the total dry land of Finland. In South Lapland are found some open peat bogs which have some value as fuel, and at times there are found fenlands covered with stunted pine trees.

Climate. The climate of Finland is comparatively mild. The northerly situation, between 60 degrees and 70 degrees north in latitude, is largely tempered by warm southwesterly winds. Snow does not normally fall until January, except in the interior, where it is known to occur in November. It is usual for the coastal waters to freeze for the winter, though the port at Helsinki can sometimes be kept open all the year. The later winter and spring are sunny, and the summer, though short, lasting from the middle of June until the end of August, can be depended upon to provide warm and dry weather. Even in Lapland great heat is not unusual in July.



FORESTRY IN FINLAND
Coniferous forests extending as far as the eye can reach, north of the Arctic Circle
Photo: Timber Development Association



FINNISH RURAL LIFE

1. Lapps with their boats 2. Timber waiting for export in the harbour of Kotka, Gulf of Finland 3. A dairy farm showing the fires which are lit to smoke flies away 4. A wooden windmill 5. A fine catch in the salmon fisheries 6. Making tar. 7. Floating timber from the forest to the timber mill

Photos: *Finnish Legation, Timber Development Association*

The characteristic of the Finnish summer is the absence of darkness at night, found in all northerly countries and sometimes known as the "White Nights." In the extreme north the midnight Sun is visible in May and June.

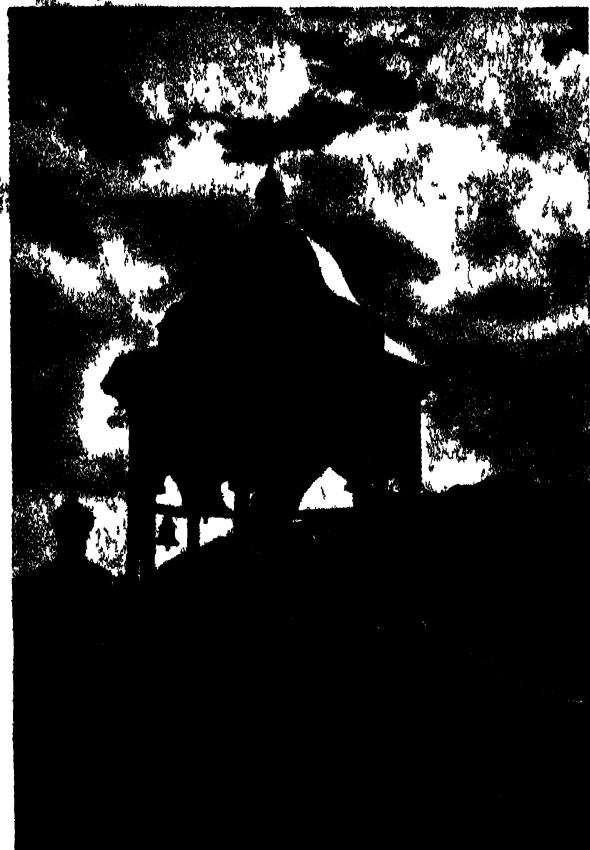
Agriculture. As elsewhere in the Baltic, the natural resources and conditions dictate occupations, which are mainly agriculture, forestry and fishery. However, the water power of some of the river rapids is being utilized to develop an industry mainly connected with the exploitation of forestry wealth. The Finnish workman, famous for centuries for the skill of his handicraft, is bringing that skill to bear on the problems of the industrial uses of timber. Farming claims some 60 per

cent of the population, although the cultivated area covers only 7·7 per cent of the land. Because of the State policy of assisting the small-holder, which was universal in the new Baltic States, the great majority of the farms are under twenty-five acres in extent.

The co-operative system is also encouraged and well developed. Since the establishment in 1923 of a Central Agricultural Experiment Station and of several sub-stations connected with it, great strides have been made in Government research and assistance for farmers, while agricultural education is catered for in some ninety agricultural schools and in the University at Helsinki.

Potatoes, oats, and rye are the main crops,

these being grown for home consumption for the livestock and dairy industry. The latter yields considerable annual quantities of eggs and butter for export. The types of cattle are both homebred and Ayrshire, while the Finnish horse, though small in size, is noted for its endurance and particularly for speed. It is a



RELIGION

A beautifully proportioned chapel in the far north
Photo Finnish Legation

cross of north and central European breeds with the Mongolian horse.

Abundance of water has also had its effect on industrial determination. Fishery has become an important asset, rivers and lakes and the coastal gulfs yielding plentiful and varied catches. Salmon are caught in several rivers, but mainly in those flowing into the Gulf of Bothnia in the west, the rights in salmon fishery being a State monopoly.

Some of the rivers form rapids of unusual vigour, and these are being utilized for the production of electric power to which local industrial undertakings can be harnessed. The most notable example of this is to be found

on the Imatra Rapids of the River Koksi, the largest rapids in Europe—twenty-five yards in width with a fall of seventy-two feet in some 4000—where, since 1929, a State owned power plant has been in operation.

Forestry and Allied Industries. The main wealth of the country is provided by forestry and the industries allied to forestry, especially sawmilling, and the manufacture of paper and wood pulp. Except for Russia and Sweden, Finland is richest in Europe in forests, of which the State owns over one-third. The privately-owned forests are rigidly controlled by the State to ensure economic working and to prevent devastation by selfish or inexpert working, and the State is also active in research and education in forestry. Great Britain was for long the largest market for Finnish timber. Over 1,000,000 standards of sawn softwood were exported annually, and Finnish plywood, which is of high quality, represented nearly a third of the world's total exports.

Among minor timber industries, spools and matches may be noted. Paper and pulp are made in large quantities in numerous factories, and of these exports, too, Great Britain was the principal purchaser. In addition to these major industries, a small industry is growing up, mainly for the local home market, for such products as metal goods, textiles, leather and footwear, soap, glass, and luxury foodstuffs. Altogether about 18 per cent of the population are now dependent on industry.

Social Conditions. As in the other former Baltic countries, the independence of Finland dates from the breaking-up of the Russian Empire in the Revolution. In the comparatively short time that has elapsed since that event, the new Finland, spurred on by the wave of nationalism which succeeded her new won freedom, made great strides in the fields of both social progress and cultural development. Social conditions in the country probably owe their high standard to a large extent to the fact that there is little division into rich and poor, and large fortunes are very rare. (In this respect the Scandinavian neighbouring countries offer a close parallel.)

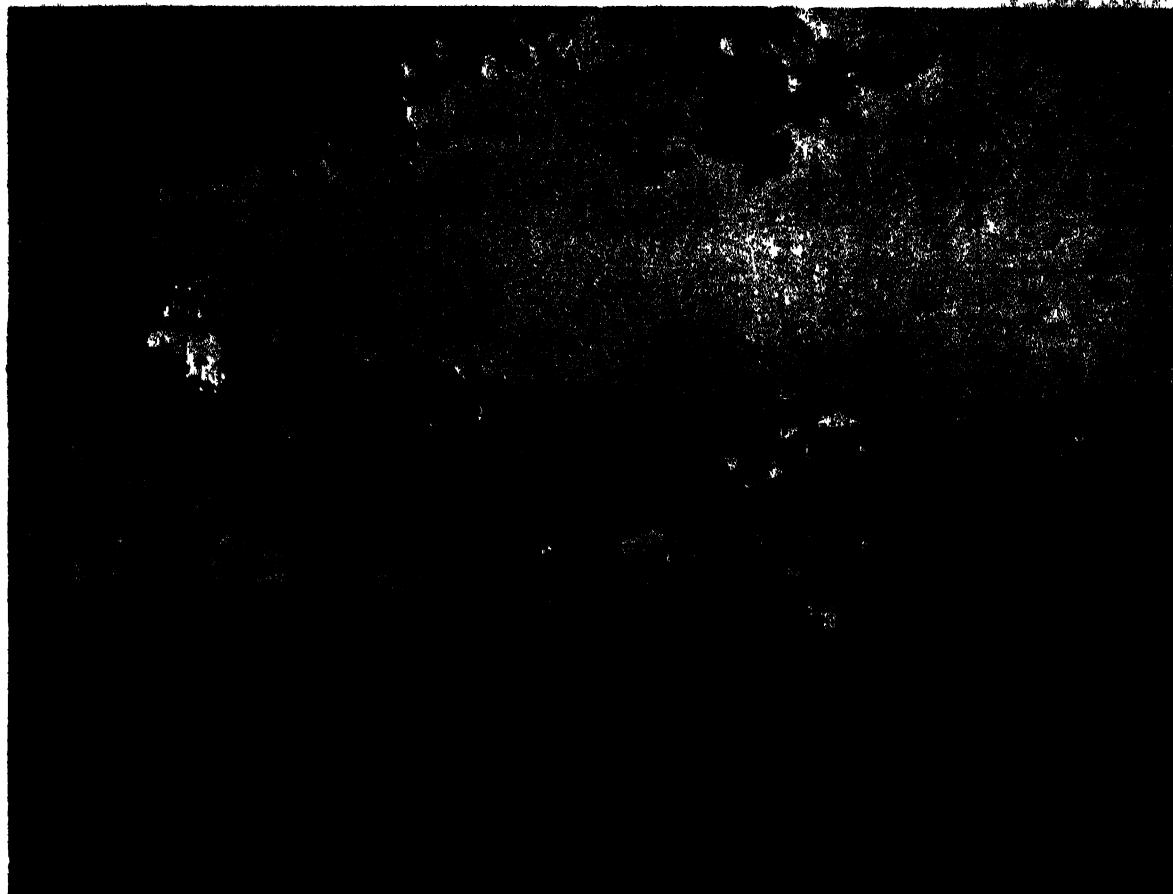
Other reasons are the small-holdings system as encouraged by the State, following on the breaking-up of the former large estates, and the democratic spread of both secondary and university education.

The standard of living is on the whole low, and the relative modesty of living circumstances of all classes accounts for the fact that to

outward appearances there is hardly any of the obvious difference in the lives of different social classes in Finland which is so striking in England and some other countries. In fact, the differences lie rather in such matters as amusements and sports than in any of the essentials such as housing or food.

efforts of the great industrial enterprises themselves. In fact it is estimated that quite half the total housing problem of the country has been solved in this way by voluntary efforts.

Total prohibition of alcohol was introduced in 1919. It was not, however, successful, since,



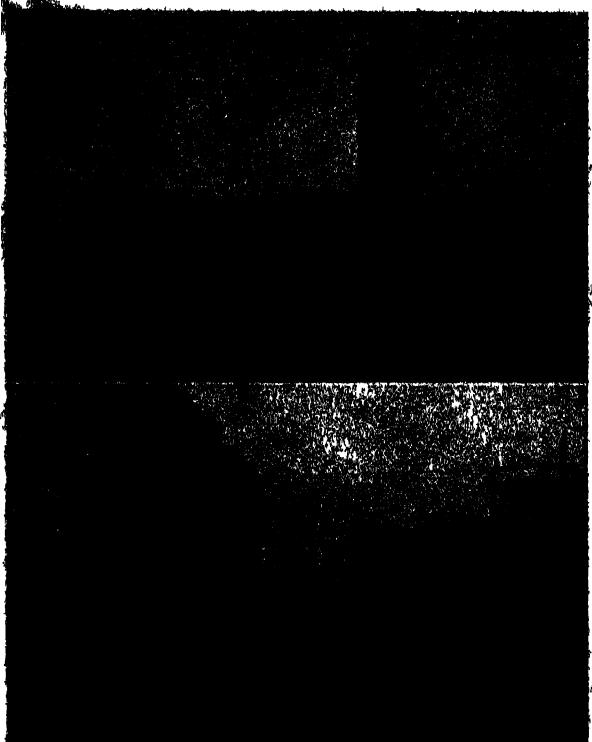
SOUTHERN FINLAND

A general view of Porvoo, typical of the charm which is a distinguishing feature of many of the smaller Finnish towns. The Church
was built about 1415

Photo - Finnish Legation

Legislative protection of labour has done much in the past years to minimize conflicts in industry. Since 1917 the eight-hour day has been applied throughout industry, and accident insurance is in full force, but compulsory old age and disablement insurance schemes have only recently been brought into force. Among social services the most notable advances have been made in housing and in child welfare. The case of housing is particularly notable, because the advance in this field, so far as industrial workers' housing is concerned, is largely the result of the voluntary

as in the United States of America, the illicit traffic proved intractable and a source of crime. Accordingly, in 1932, after the repeal of prohibition by a large majority in a national referendum held upon the issue, strict Government regulation of the sale of liquor took the place of total prohibition; the sale of liquor was then made the monopoly of a specially created corporation, in which practically all the stock is held by the Government; only 7 per cent profit is permitted by law to this corporation, the balance of profits being devoted to old age and unemployment insurance funds



After: The Railway Station, the work of the Finnish architect Eliel Saarinen. Above: A street scene
Photo: Photo Legion

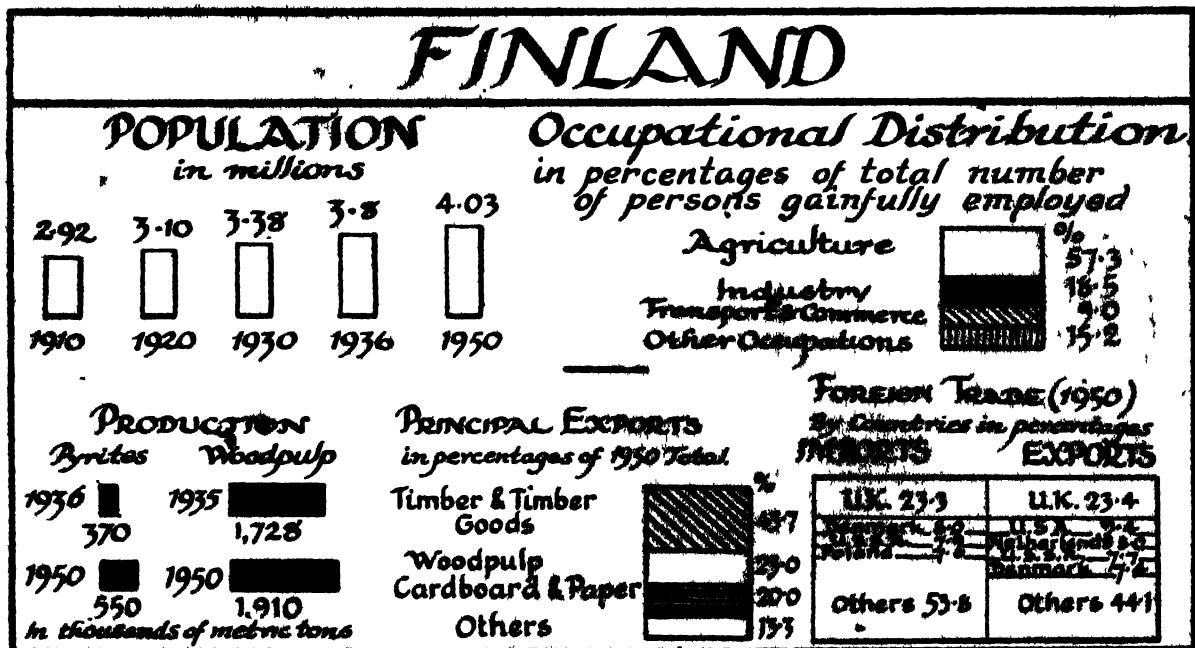
and towards the expenses of putting down illegal traffic in liquor.

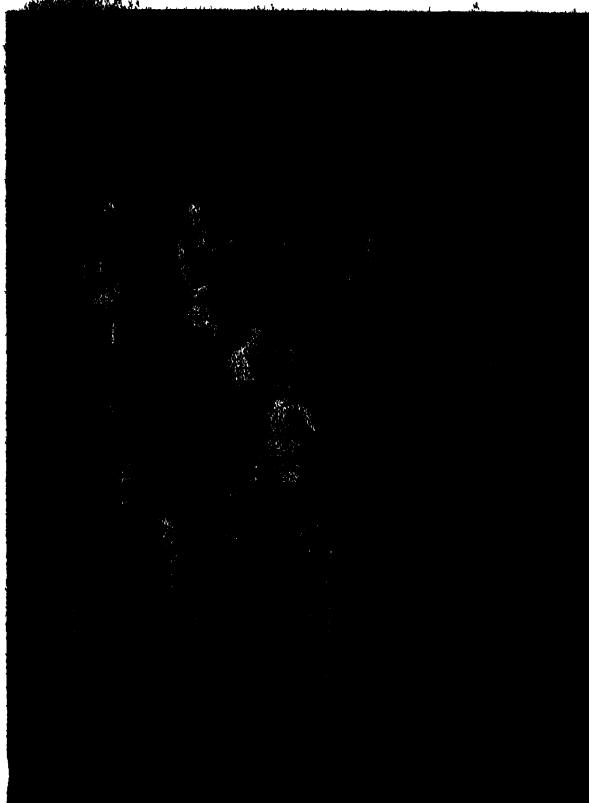
Elementary education is compulsory, and

there is very little illiteracy. Secondary education is very widely extended: of the secondary schools one-half are maintained by the State, while the remainder are supported by State grants. The great majority of the secondary schools, State and private, are co-educational. There are many schools for agriculture, dairying, sawmilling, navigation, forestry, and so forth, and three universities supply an increasing demand for higher education. The State University is at Helsinki, the capital, while at Turku (Abo) are two private universities. The university of Helsinki is also the centre for scientific academies and societies.

Sport in Finland is increasing in popularity. In the forefront must be placed athletics: skiing and skating, which are part of the every-day life in the northern districts, ice-hockey, wrestling, and Association football, are among the most popular sports. Yachting and horsemanship are exceedingly popular among all classes. In sport, as in the professions and indeed work and life generally, one of the most striking characteristics in Finland is the complete equality between the sexes.

Folk tradition, which is both valued and preserved, is to be found everywhere, and hardly a tourist is likely to fail to observe some of its manifestations in the life of the country, be it singing or dancing or costume, at one or other of the frequent rustic festivals. This innate artistic sense, which is perhaps seen at its best at the all-night festival of Midsummer





CHILDREN IN A FINNISH BATH
Photo: Finnish Legation

Eve, has left its deep impress on present-day applied crafts.

With their Swedish neighbours, Finnish craftsmen enjoy a well-deserved reputation. Furniture and other vessels and articles of wood are conspicuous for their excellent workmanship, while lace and rug making and other products of home industry are justly a cause for pride. On a more industrialized scale, textiles, pottery, and glassware have achieved a standard which, on a small scale, is excelled probably only in Sweden, and which is certainly considerably higher than comparable industrial products elsewhere in Europe.

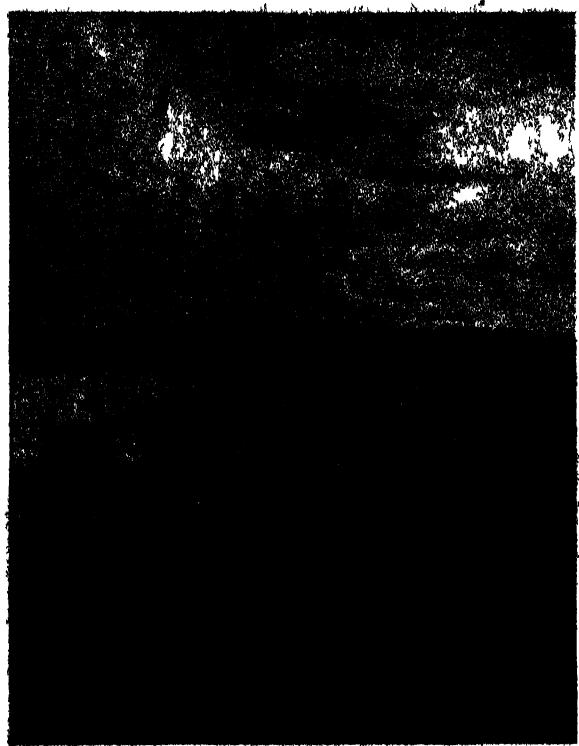
The Towns. Orderliness and cleanliness characterize Finnish cities. The virtue of cleanliness is perhaps the most immediately striking throughout the country, and even in the remote country villages and farmsteads the rough but effective steam bath is a universal institution.

Helsinki, the capital, with its population of 367,450, is, after Stockholm, the largest city in the northern countries. It has the dignity of a metropolis, with modern buildings, always

imposing and sometimes beautiful. The neighbourhood is of great industrial importance. Until recently the great majority of its inhabitants were Swedish speaking. With the growth of nationalist sentiment and the development of the Finnish language, Helsinki has become the cultural and intellectual centre of Finland.

Turku (Abo), with about 107,500 inhabitants, and a former capital, is likewise an important cultural centre, with university endowed Swedish and Finnish universities. It is the oldest town in the country, of Hanseatic origin, with a fine medieval castle and cathedral.

Vyipuri, another medieval Hanseatic town, was the second largest in the country before going to Russia in 1917. Tammer (Tammerfors), sometimes called the Manchester of Finland, is an example to its adoptive namesake as illustrating how clean and light an industrial city can be. The secret of its extreme cleanliness lies in the fact that most of the power is furnished by the rapids of Tammerkoski. The remaining towns are mostly of less than 10,000 inhabitants, but are in many cases distinguished for their charm.

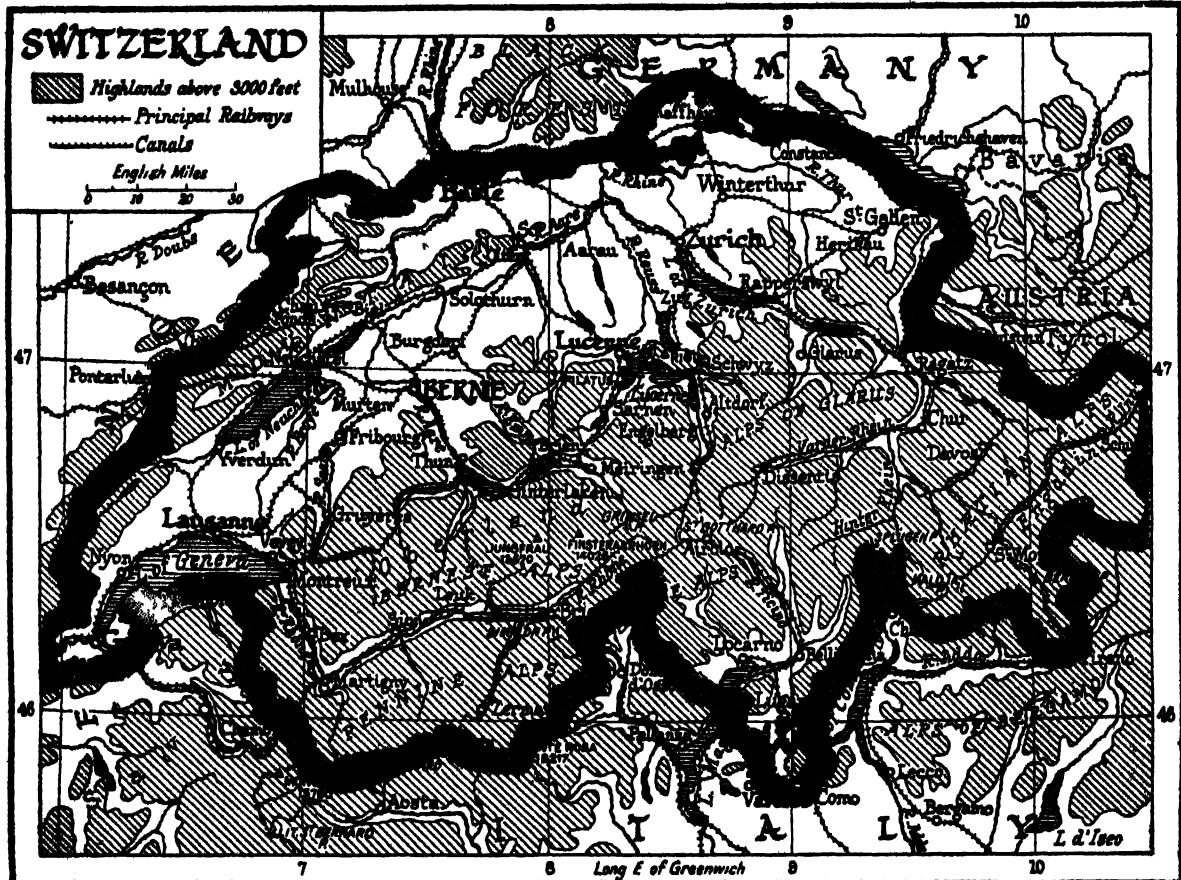


PEELED LOGS STORED AT SUKEVA
These will be used either in a paper or a cellulose factory
Photo: Finnish Legation

SWITZERLAND

SWITZERLAND with its 15,944 square miles is one of the smallest States of Europe. The whole area is only about twice that of Wales and the greater part of this is mountainous. In fact none of it is low-lying, even if a small part is comparatively level. Some 60 per

countries of Europe it cannot be regarded as a physical entity. A lack of unity is obvious in its physical geography and is reflected in its population, with its twenty-two semi-independent cantons, its four languages, French, German, Romansch and Italian, and its



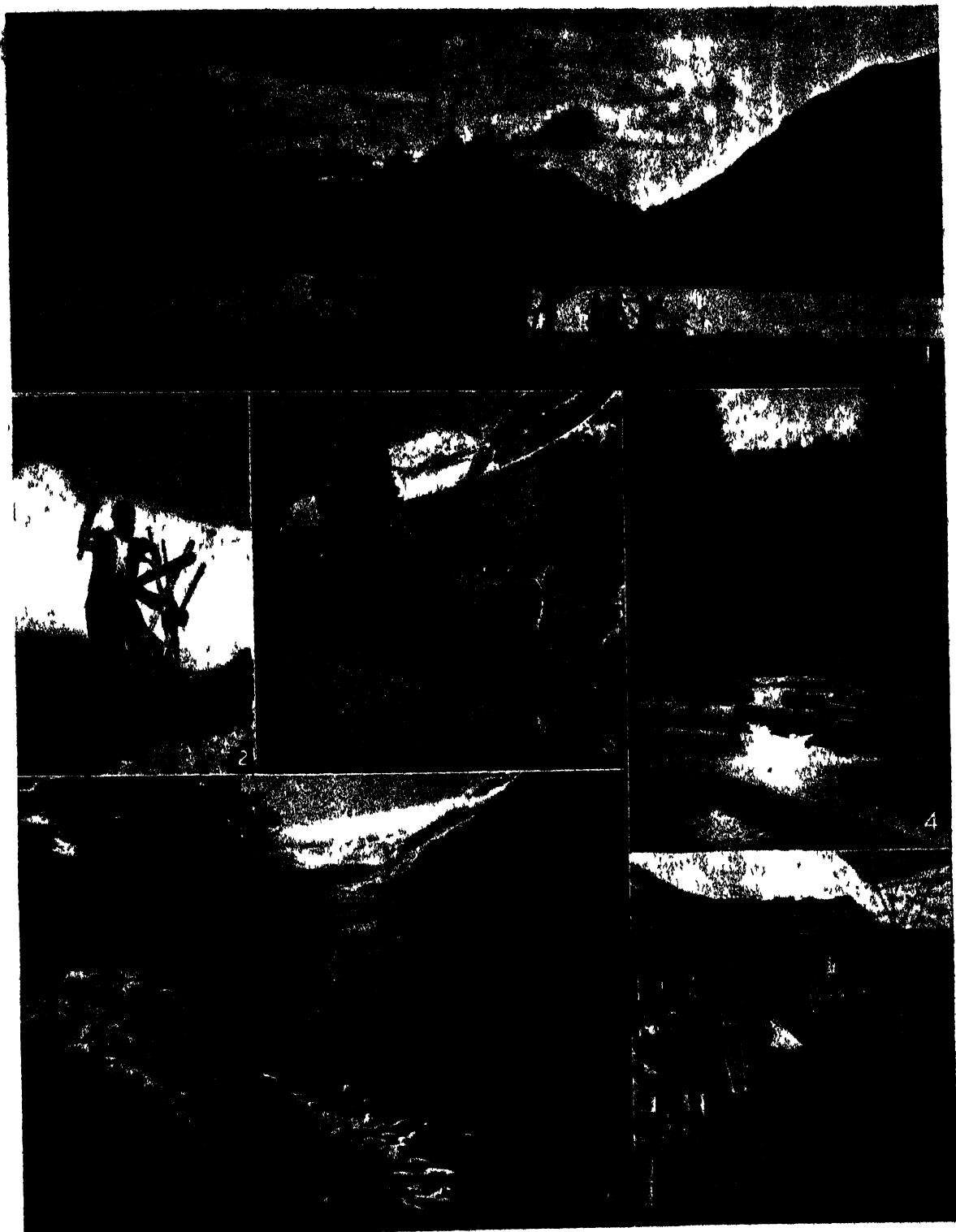
ALTERNATIVE PLACE NAME SPELLINGS

Basle = Bâle, Lake Constance = Bodensee; Lake Geneva = Lac Leman; Geneva = Genève; Lucerne = Luzern; Tyrol = Tirol

cent of the total may be called Alpine, and none of the remainder is under 1000 feet in elevation. This little country may be regarded as the highland core of central Europe; it lies between France, Italy, and Germany, forming a kind of buffer State. Although as a State Switzerland stands aloof from the other

diversity of cultures. In some areas communications with adjoining States are easier than with other parts of Switzerland.

The central position of Switzerland in Europe, the focus of routes that it offers and the neutrality it has long expressed have made it a meeting place of many peoples, and its



WORKING THE LAND

1. Gathering the harvest by a mountain lake. 2. Making a fence in the Bernese Oberland. 3. Transporting the hay from a hillside field.
4. Floating logs downstream from the pine forests. 5. Sheep on a mountain pasture with the Palti glacier in the background. 6. Looking
towards the Morteratsch glacier and the Bernina mountain group.

Photos: St. Moritz Information Bureau; Albert Steiner; Swiss Federal Railways, F. Hutzli, Reichenbach; P. J. Green

scenery has caused it to become one of the playgrounds of Europe.

The conception that all Switzerland is highly rugged is a mistake, and so too is the impression that most Swiss are mountaineers. None lives far from mountains, but more than half of the population dwells on the Swiss plateau, which covers less than a third of the country. Also it must not be forgotten that nearly 20 per cent of the population live, not in scattered farms or Alpine villages, but in large towns.

As distinct from the purely administrative areas, three great divisions of the country can be recognized, all of which are parts of the great mountain system that extends through southern Europe from Spain to the Caucasus. These regions are, in the south, the Alpine area that covers half of the country, the high level plateau or hill district and, on the north-west, the low Jura Mountains.

The Alps. The Alps are very complicated in structure and show a great diversity of relief. Broadly speaking they are part of the great folded, over-thrust and faulted mountain ranges that were a feature of crustal movements in Tertiary times. The controversial theories regarding the exact mode of origin need not be considered here, but it is worth noting that the problem of their origin has made the Alps the scene of long continued geological study, which is by no means ended.

To the south and south-east of Switzerland lie the main ranges of the crystalline Alps, so called from the nature of the rocks that were heaved up from a great depth in the Earth's crust to make these compact ranges. They include the Cottian, Graian, Pennine and Lepontine Alps. Most of the southern flanks of the Alps are actually Italian territory, but in one place Switzerland reaches to the Italian plain, and includes the greater part of the beautiful Lake Lugano and the northern end of Lake Maggiore. The Pennine Alps show many outstanding peaks, including Monte Rosa, 15,217 feet, Weisshorn, 14,804 feet, and the Matterhorn, 14,837 feet.

In the eastern end of Switzerland—the Grisons and Engadine district, through which the Ian drains to the Danube—the structure of the Alps is even more complex than farther west. Here the mountains are lower, have apparently suffered less destruction by weathering agencies, and may represent some of the later folds or layers of the Alpine thrusts. Bernina, on the Italian frontier, is 13,288 feet in height.

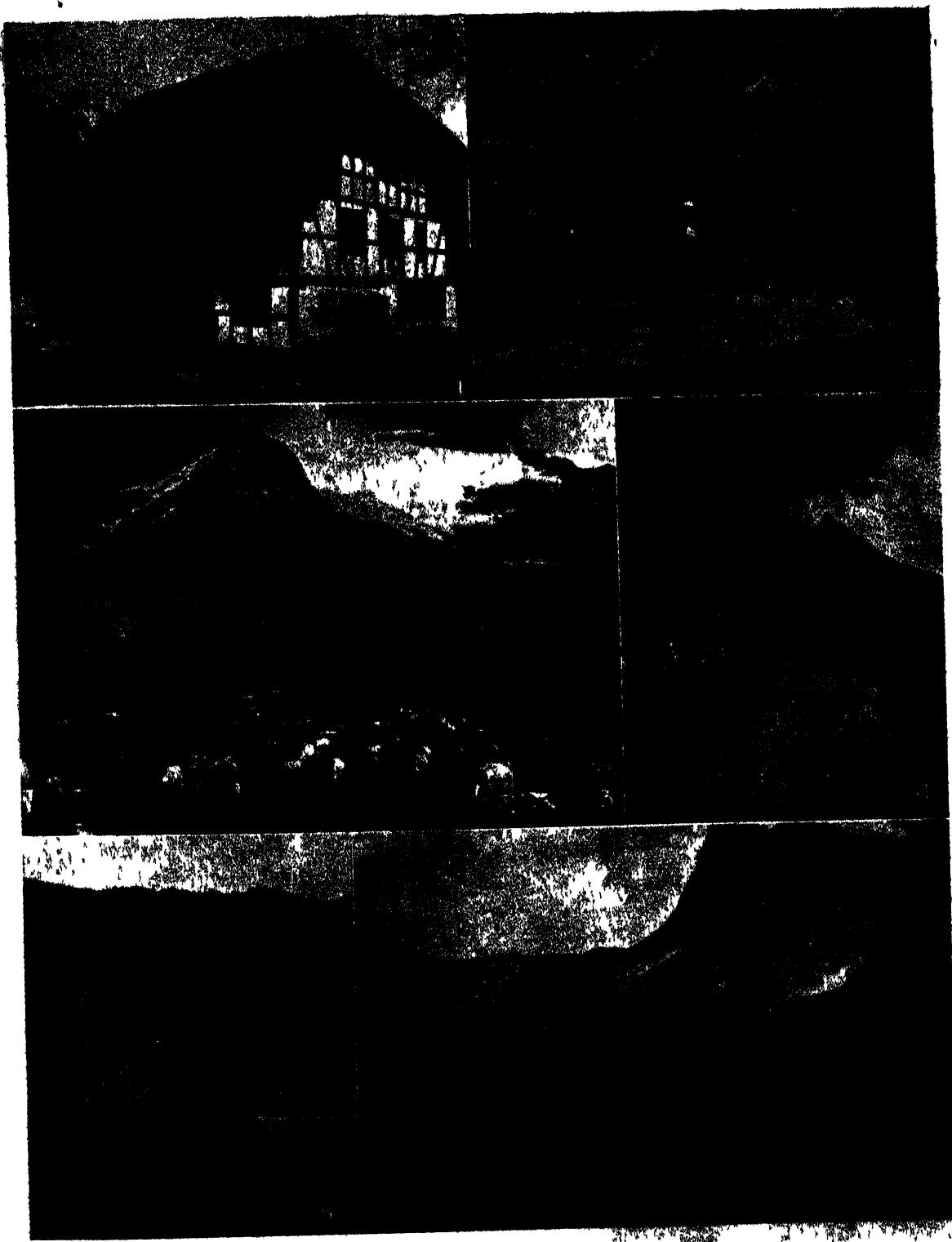
On the north and north-west of these crystalline or axial Alps lie the high calcareous Alps, which, as their name implies, are of softer rocks and ones of less deep seated origin which lie towards the northern side of the area of great Tertiary uplifting. This belt, which includes the Bernese Alps or Oberland, with the Jungfrau, 13,670 feet, Finsteraarhorn, 14,026 feet, and Monch, extends into France and Germany. There occur, imbedded as it were, in this area old blocks of hard crystalline rocks, fragments of a more continuous bulwark in past geological times. These old earth blocks account for such well known peaks as Mount Blanc, 15,782 feet, which is actually in France, the St. Gotthard Massif with its several peaks, and the Aar Massif. To the north-west the Alps slope down through generally decreasing elevations to the plateau.

The Alps have undergone vast changes since they were uplifted, by the erosive action of weather, water and ice. Their peaks bear little relation to the actual folding and up-heavals, and have often been carved out of former low-lying areas.

During the last great Ice Age all the Alps were covered by an ice-sheet except a few isolated peaks that stood above its level. Such peaks to-day owe their sharp outlines to the influence of frost: they escaped the smoothing action of the moving ice and so are attractive to the mountaineer looking for dangerous rocks to climb. The valleys were scooped out and given rounded contours, and the debris was carried to lower levels. Many Alpine valleys have small lakes, often formed by morainic dams.

To-day the level of perpetual snow varies from 8500 to 10,000 feet, depending on exposure, but valley glaciers reach as low as 4500 feet before melting. Some 800 square miles, or about one-twentieth of the area of the country, is still covered by glaciers which, however, show unmistakable signs of retreat in recent years.

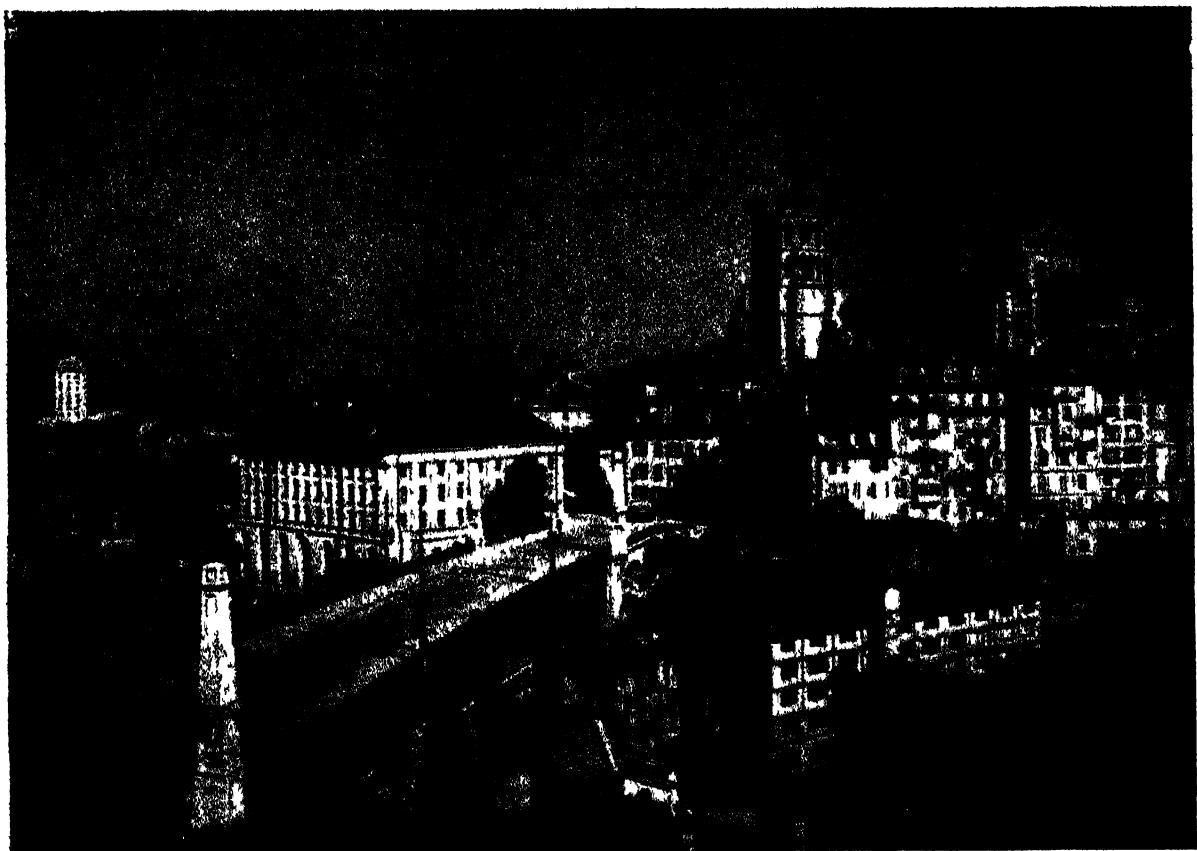
The Alpine Passes. Heavy snow and rain cause numerous active rivers, some of which flow in valleys between successive folds, while others cut across the folds and form convenient routes through the Alps. In the eastern Alps fewer transverse routes give less ease of access. Of the many routes, two between Switzerland and Italy are of great importance. The Reuss Valley from Lake Luzern (Lucerne) on the plateau, leads through the calcareous Alps and brings the traveller to the St. Gotthard Pass at an elevation of 6935 feet, from which he can pass down the Ticino Valley to the plains of



COUNTRY SCENES

1. A thatched and half-timbered cottage reminiscent of the English landscape. 2. An Alpine meadow at 7000 feet above sea-level. 3. Cattle grazing in the Aletschwald. 4. The Jungfrau from Wengen. 5. A medieval castle on Lake Lucerne. 6. The slopes of the Wetterhorn

Photos: P. J. Grun; Swiss Federal Railways; Topical



LAUSANNE
Chief town of the Canton of Vaud
Photo Swiss Federal Railways

Lombardy. This pass is now largely superseded by a winding tunnel, nine and a quarter miles long from valley to valley, at a maximum height of 3785 feet.

The second pass of great importance is the Simplon, at an elevation of 6600 feet in the Lepontine Alps, linking the upper Rhône Valley with the Toce and Lake Maggiore. The Simplon tunnel, twelve miles long at an elevation of only 2260 feet and so with easier gradients, was the second Alpine tunnel to be constructed. The use of this tunnel, however, necessitated a third, the Lötschberg tunnel, nine miles long, under the Gemmi Pass (7000 feet), in the Bernese Alps. Farther west the famous St. Bernard Pass at 8110 feet links the upper Rhône Valley with the Dora Baltea and the plains of Lombardy. No railway follows this route.

The Swiss Plateau. The Swiss Plateau or hill district of Switzerland is the most important part of the country. It represents an old basin that has been filled up by the water- and ice-

swept waste from the Alps and the Jura on its flanks. In the course of geological time, subsequent to the upheaval of the Alps, the basin gradually became a series of lakes or inland seas. In these lakes various kinds of coarse and fine debris were laid down. Then, during the Ice Age, the glaciers of the Alps flowed out over the plateau, spread right and left, laid down their morainic material and modified the surface conditions. Eventually these glaciers melted, as the Ice Age receded, and the plateau was left with a surface rough and uneven with scattered glacial debris which the running streams began to re-assort. Thus to-day the surface is irregular and diversified, a region of hill and valley, of many lakes and rivers. The hills are perhaps a hundred to a thousand feet above the plateau floor which itself lies at 4600 feet near the Alps and only 1300 feet near the Jura. The plateau averages little more than thirty miles in width, and it affords easy access south-westward by the Rhône Valley with France, and north-eastward with Germany.

The Lakes. On these two frontiers lie the two largest of many lakes, each filling an area once covered by the ends of the Rhine and Rhône glaciers respectively. Lake Constance or Bodensee has an area of 208 square miles and Lake Geneva or Léman 225 square miles. The other lakes on the plateau, Neuchâtel, Luzern, Zug, Zürich and others, mark the sites of other glacial ends.

The varied soils of the plateau and its favourable climatic conditions account for its density of population and relative importance. In its heart at an obvious focus of routes lies Berne, the Swiss capital, and on its northern entrance, the Rhine Valley, Basle has a commanding position. The numerous rivers afford much scope for the use of hydro-electric power.

The Jura Mountains. The third and smallest of the physical divisions of Switzerland is the Jura. This is a region of successive low limestone ridges and valleys, simple folds on the edge of the great Tertiary disturbances. They rarely rise to over 5000 feet, and at their eastern and western ends are cut through by the Aar and the Rhône. To the plateau there is a steep descent, and since the Jura lie on the direct line between north-western Europe and the Alpine routes, they have been tunnelled for several

railway lines, which nevertheless follow circuitous routes in this region of parallel ranges. Most of the Jura Mountains and the Jura plateau are beyond the domain of Switzerland.

Climate. In a land of such varied relief there obviously is a great range of climate. In a broad way it is true to say that the Swiss climate is cool and rainy, but in detail this statement needs qualification. On the plateau the monthly temperatures range from about 28° Fahrenheit in January to about 65° Fahrenheit in July, and the annual rainfall ranges from thirty to forty inches, depending on the exposure to rain-bearing winds. Some of this falls as snow. The Jura Mountains are colder and wetter.

It is in the Alps, however, that the greatest extremes of temperature and the chief variations in climate occur. The valleys are especially warm on summer days, and very cold on winter nights, when the heavy cold air sinks and collects. Above 5000 feet the average temperatures rise little over 50° Fahrenheit in the warmest month, and there are at least five months with temperature below freezing point. But in the sun a southward facing slope may feel pleasantly warm even in midwinter. At great heights also the air is clear and, especially



GENÈVE

The Palace of the old League of Nations
Photo: Swiss Federal Railways, Alfred Pachet

in winter, often dry, which gives invigorating conditions, even if the temperatures are low; hence the vogue of high level resorts as sanatoria for sufferers from chest complaints. In the Alps rain and snow are abundant, especially on the southern and western slopes, but the protected valleys receive less. A feature of many Alpine valleys is the warm dry *fahn* wind down the slopes, a wind warmed by compression as it falls.

Forest and Farm Land. Climate and soil alike make Switzerland, below its rocky summits, a land of natural forest and pasture, and this is reflected in the interests of its inhabitants. Nearly a quarter of the land area is wholly unproductive, and of the rest almost a quarter is still under forest. Half the productive land is under grass and pasturage, and the rural Swiss may be regarded chiefly as a pastoral people. Cattle, and principally milch

cows, are the most numerous livestock, but there is a great deal of pig breeding.

The pastures of the Alpine valleys and higher slopes are a feature of Switzerland. The small villages with their scattered wooden houses and barns lie generally in the fertile basins of the valley floors, where former ice wore away talus rock, or irregularity in moraine deposits left hollows. Long since, most of the lakes have drained, and their sites are marked by well watered alluvial soils. Around the village lie the fenced and manured pastures, and perhaps some fields of cereals for home consumption. But cheap imported cereals have led to a decrease in their growth in Switzerland, and hay is the dominant Alpine crop. This must be carefully gathered for winter feed to the flocks. The fields are often protected by belts of trees.

High up on the valley slopes comparatively level shelves, once cut by ice, afford Alpine pastures of short grass but fair fertility. Here the cattle can graze in summer, while the lower pastures are reserved for the harvest of hay. It is these pastures that afford the brightest colour in their varied herbaceous growth, and add immensely to the allurement of Alpine scenery. It is, however, in the plateau that the greatest number of dairy cattle are to be found; they are chiefly stall fed, and so not obvious to the traveller.

The Jura, too, is an area of dairying, though on the less steep south-eastern slope with a good sunny exposure the vine is much cultivated.

The pastoral activity expresses itself in Swiss condensed milk, cheese, and milk chocolate, and in a certain amount of leather and leather goods.



THE BERNESSE OBERLAND
A Scottish Reel on the ice
Photo Photopress

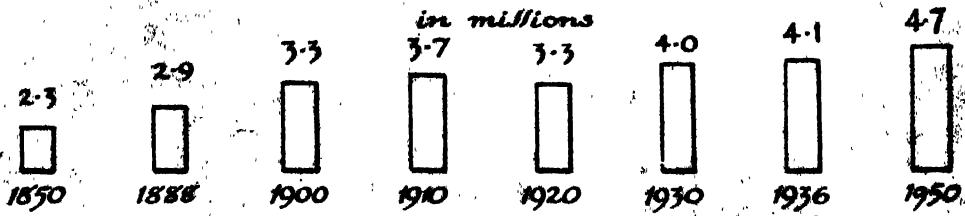
The Wealth of Switzerland

SWITZERLAND is situated in the heart of central Europe; like Hungary and Czechoslovakia it has no direct access to the sea and does not own colonies. The climate does not favour corn growing; the mountain rocks are wholly unproductive and the highlands are not suitable for arable farming. Switzerland cannot attain self-sufficiency in foodstuffs and moreover, its industry lacks the basis of home-mined coal or iron or other mineral wealth. Nevertheless, an area of 15,944 square miles is inhabited by 4,714,992 people (1950 census:

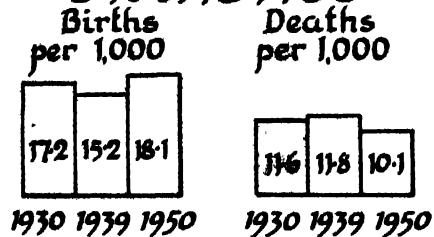
a rise from 4,066,400 in 1930), and the density of the population—296 to the square mile—is higher than in France (189) or England (111), and in the whole of Europe is only exceeded by Great Britain (350), Belgium (295) and the Netherlands (275). As in the case of leading industrial communities, the chief towns in the Swiss Confederation are concentrated in the Alpine valleys, and the map of the country reveals two sharply contrasting regions—the Latin and the Teutonic. The latter includes most of the population.

SWITZERLAND

POPULATION



VITAL STATISTICS



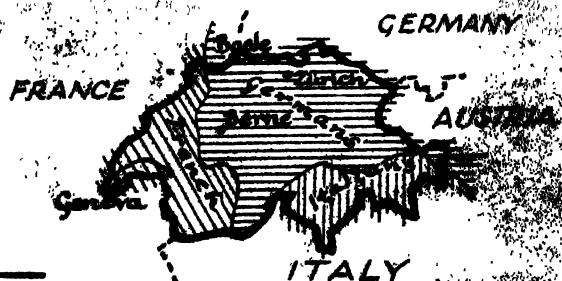
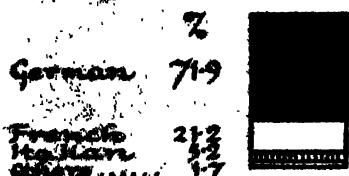
OCCUPATIONAL DISTRIBUTION

in percentages of total number of persons gainfully employed



ETHNICAL DISTRIBUTION

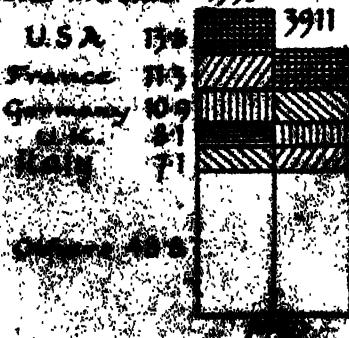
In percentages
according to Mother Tongues.



IMPORTS & EXPORTS

Foreign Trade in millions
of Swiss Francs in percentages

Total IMPORTS 4536



EXPORTS Total 3911



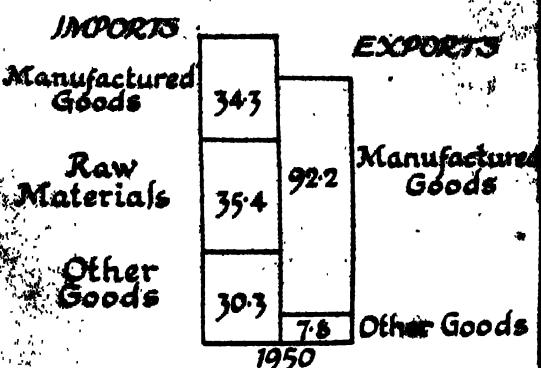
Classified by Commodities
in percentages of Totals

IMPORTS

Manufactured Goods

Raw Materials

Other Goods



EXPORTS

Manufactured Goods

Other Goods

1950

The development of Swiss industry was bound up with the increase in population, though its beginnings go back much further, but at the same time as industry developed, Swiss agriculture declined. From the end of the last century the utilization of hydro-electric power afforded a new basis for the development of industry, and the building of the big railway tunnels increased the traffic facilities, especially with Germany and Italy. Finally, the new fashion of taking holidays in the Alps and of mountaineering and ski-ing developed the tourist industry which has grown up during the last sixty years. The number of the rural population decreased by 20 per cent during the last fifty years and the whole increase of the population was absorbed by industry, commerce and allied occupations. Switzerland ranks nowadays among the most highly industrialized countries; the proportion of 43·5 per cent engaged in industry being comparable with the figure for Great Britain. To explain more fully Switzerland's economic structure and achievements which were attained in spite of natural disadvantages, we must describe the different branches of economic activity.

Agriculture. Of the total area 2,301,000 acres, or 22 per cent, are unproductive and 2,372,000 acres, or 23 per cent, are forests. Only about 55 per cent is cultivated, of which two-thirds is used as grass land and pasturage. Less than 5 per cent of the total is suitable for corn growing.

In the high altitudes the winters are long and rain is excessive. This makes a large part of the country only suitable for grass land and pasturage. But the higher levels provide ideal ground for cattle raising on account of the first class quality of the fodder and the intense sunshine, without which the Swiss dairy farming industry could never have attained the success which it actually enjoys. The so-called *Alpwirtschaft* characterizes Swiss dairy farming; the cattle are driven into the mountains in spring and back to the valleys in the autumn. Milk production in 1951 was 26,800,000 quintals. Cheese is an important export. The Government has successfully fostered the raising of cattle for slaughter, with the result that imports of livestock and meat into Switzerland have shown a steady reduction. The total number of cattle in 1950 was 1,530,000, of which more than half were cows. Another domestic source of meat is derived from pig-raising; the number of pigs rose from 570,000 in 1911 to 908,000 in 1950. In this year there were also

180,000 goats. The grass land is also a good breeding ground for poultry.

Agriculture is mainly carried out on the plateau; its typical feature is the large number of small farms and the absence of big estates. This supplies the reason for the social stability of the Swiss peasant population. As a result of protection by higher duties, the wheat growing area has been increased, but Switzerland is still dependent on importation for the greater part of its corn supplies. In 1950, imports of wheat were valued at as much as 120,800,000 francs. Vegetables, fruits and wine are other important agricultural products. Vines are grown on the slopes in the south and along the lakes in the west.

The output of the main Swiss agricultural crops may be compared as follows—

YIELD IN THOUSANDS OF QUINTALS

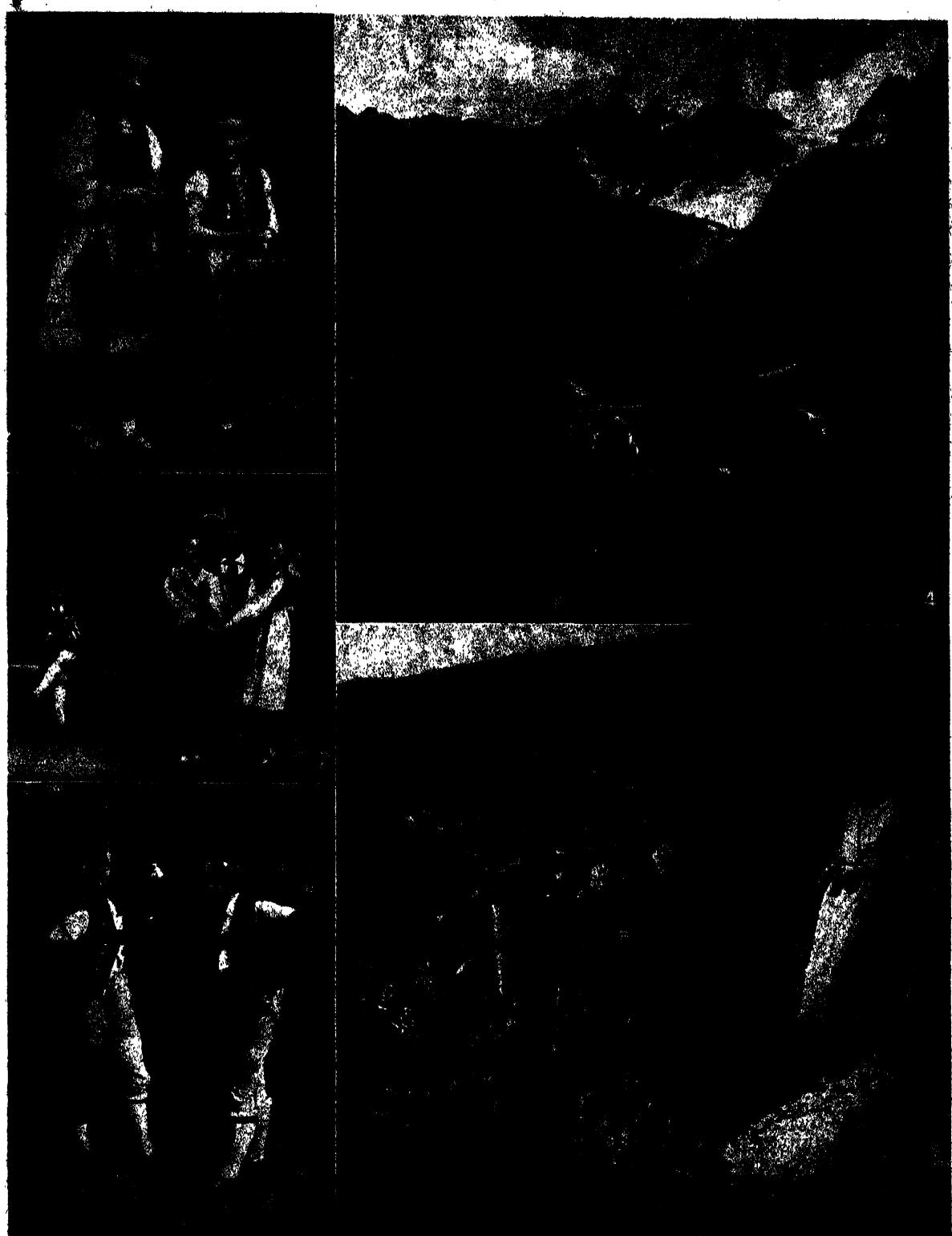
		1938	1950
Wheat	.	2,126	2,000
Rye	:	367	330
Barley	:	92	390
Oats	:	254	480
Potatoes	:	7,380	11,300
Sugar beet	:	740	2,280

Other agricultural produce in 1950 included fruit (11,636,000 quintals); wine (720,300 hectolitres); milk (25,700,000 quintals); and cheese (563,000 quintals).

Forestry. Favoured by the moistness of the climate, forestry is highly developed. The largest forest areas are in the cantons Graubuenden and Berne. The annual cutting of wood amounts to about 3,000,000 cubic metres.

Mining. The mineral wealth of Switzerland is negligible; she possesses no coal-fields, but iron ore and manganese ore are mined in the Canton of St. Gall (Gonzen mine). Salt is produced in Bex (Canton Vaud) and in Rheinfelden and Ryburg. The total production was 104,206 metric tons in 1950. Asphalt is found in the Val de Travers (Canton Neuchâtel).

Industry. As already pointed out, modern Switzerland is essentially an industrial country. At the present time approximately 868,000 persons are engaged in handicraft and industry. Swiss industry cannot draw upon mineral resources or sell its products to an extensive home market; it is mainly a finishing industry using the skilled labour available in the country for production of goods made from foreign raw materials and destined to be sold



RURAL SCENES

1. Swiss girls in national costume. 2. Peasants in mountain costume. 4. A valley in the mountains showing a peasant woman with scythe and the *spedda* basket used for transporting from field to farm. 3. The harvest of the grape

Photos: Swiss Federal Railways. A. Padrett: C. Schildknecht. Max Kettel: P. T. Gram

abroad. Though industrialization has developed to its present extent only during the last hundred years, the beginnings of Swiss industry go back to the fourteenth century and capitalistic development started as early as the sixteenth century.

Among the oldest industries are silk manufacturing in Berne and Zürich and watch-making in Genève. Refugees from Italy,

nineteenth century; the aluminium and electro-chemical industries are based on hydro-electric power, which constitutes the only real natural wealth of the country. During the last twenty years the electrification of the railways has entirely displaced steam-driven trains fuelled with coal bought abroad.

Only two industries use dairy products. Condensed milk is manufactured in Cham and Vevey, the chocolate industry is situated in Vevey, Berne, Zürich and elsewhere. Both industries grew rapidly in the two decades before the first World War; exports of condensed milk were more than doubled between 1892 and 1913, while those of chocolate, during the same period, were doubled many times over. By 1925 the export figures for these two commodities had reached their peak, but eleven years later, in 1936, they were showing a decline to well below the 1892 level. From this reversal they are at present recovering by degrees. This shows clearly the effects of modern economic nationalism on export countries like Switzerland, though it must be remembered that Swiss concerns have set up works in foreign countries to avoid the payment of duties so that, though the Swiss labour market suffers from the loss of production, yet the profits are still accruing to Swiss capital.

Among the textile industries, the linen and woollen trades are very old. The beginning of the cotton industry date back to the fourteenth century. At the end of the eighteenth century, French refugees contributed to its development, especially in Zürich. A Swiss speciality is the embroidery industry of St Gallen, founded in the second half of the eighteenth century. This industry, which flourished before the 1914-18 War, was badly hit through changes in fashion in the years between the wars, and shrank in consequence to a mere fraction of its former size. Thousands of embroidery machines became idle, and their highly skilled operators were forced to seek employment elsewhere. At the same time the cotton industry itself was experiencing a severe setback, unable to find sufficient markets for its products. Exports fell sharply and there was a corresponding reduction in the number of spindles in use. Since the second World War the cotton industry has made considerable progress towards recovery.

The principal seats of the silk industry are Zurich and Basle; the raw silk is mainly brought from Italy. Here, too, the story of an inter-war slump is the same. On the other



STREET SCENE IN LUZERN
Photo Fox

France and the Netherlands contributed to the growth of the first industries. The development was continuous, since the country preserved her political neutrality and was not disturbed by wars as was Germany and, as the late Professor Landmann pointed out, since big estates were lacking industrialists invested the whole capital accruing from profits again in industrial enterprise.

When mechanical water power, which had been used in the textile industry, was replaced by steam in the nineteenth century, the Swiss engineering industry came into existence, its special task being to construct fuel-saving machines, since coal was expensive. The utilization of the abundant water power for electricity was not begun until the end of the

hand, the production of rayon was developed successfully in this period, even if exports were insufficient to offset the losses sustained by the silk trade. The country possesses also some leather works, and flourishing shoe factories are situated in Schoenenwerd and Olten.

The engineering industry was developed during the nineteenth century and includes all important branches, for example, textile machinery (Zurich, Baden), electro-technical apparatus, locomotives and agricultural implements. Exports of machinery totalled 863,000,000 francs in 1950.

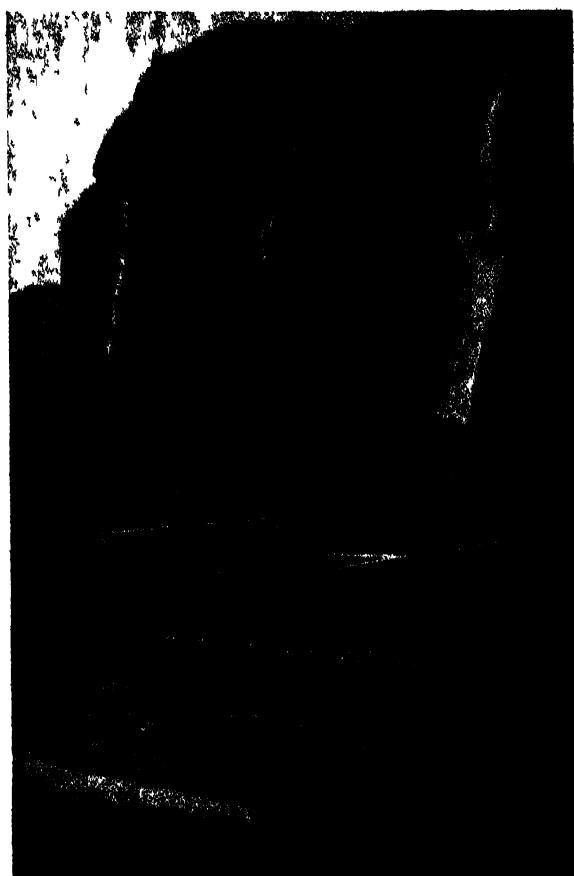
Watchmaking was first started at Genève (which is also celebrated for its jewellery) during the sixteenth century, then in the Cantons Neuchâtel (Le Locle, La Chaux de Fonds) and Vaud; in the nineteenth century the industry spread farther along the Jura (Biel). Watchmaking is essentially an export industry and Swiss watches are noted for their high quality. In order to compete with the mass production of Germany and the U.S.A., domestic work had to be replaced by machine work to a large extent during the present century; the proportion of home workers in the industry was less than 10 per cent in 1936 as compared with 33 per cent in 1905. By 1950 the number of factories had increased to over 1000, and they gave employment to over 45,000 workers. Exports were 730,200,000 francs in 1950 as compared with 151,600,000 francs in 1936. The number of watches sold has increased by still greater proportions, especially since the first World War, because cheaper watches now form a greater proportion of the total sales.

The chemical industry, the principal centre of which is Basle, was founded in the latter half of the nineteenth century; it covers the whole range of chemical manufactures; dyes and pharmaceutical products being the most highly developed. Its progress was very rapid; export of chemicals rose from 18,100,000 francs in 1892 to 67,500,000 francs in 1913 and then quadrupled itself in the period since the first World War, being 306,400,000 francs in 1950.

Development of Water Power. The development of hydro-electric power was the foundation of electro-chemical processes (production of calcium carbide, etc.). Water power also provides the basis for the aluminium industry at Neuhausen on the Rhine and more recently at Martigny in the Rhône valley, which, though it works with foreign raw material (bauxite), has the advantage of low

power costs. Production was begun in 1889, and increased at a steady rate; but owing to the development of the industry in other countries, Switzerland's share in the world production of aluminium has fallen to about a quarter of its former level.

Water power was first utilized for the generation of electricity towards the end of the nineteenth century. The industry expanded



LAUTERBRUNNEN

Waterfalls 2000 feet in height dominate the village

Photo P J Green

rapidly; the maximum capacity of hydro-electric power plants rose from 131,000 kilowatts in 1900 to 402,000 kilowatts in 1910, to 810,000 kilowatts in 1920, to 1,536,000 kilowatts in 1930 and to 2,862,000 kilowatts in 1950. It is estimated, moreover, that this figure represents no more than one-third of the probable water power resources.

The power stations, which are situated on the Rhône, Rhine, Aar, Limmat and other rivers, numbered 6100 in 1949-50, and their total production of energy was about 10,500,000,000

kilowatt hours. The utilization of water power in industry and transport affords the reason why Swiss coal imports are now considerably lower than they used to be.

Communications. The total length of Swiss railways (excluding funiculars) was 3250 miles in 1950, of which only 200 miles were not electrified. Whereas the plateau is easily

material for its industries; it tries to pay for these imports by exports of manufactured goods. Nevertheless, statistics show a regular import surplus (1886: 16·5 per cent, 1913: 28·3 per cent, 1936: 30·4 per cent). In 1950, the total import surplus amounted to 625,000,000 francs. The only year when there was an export surplus was in 1945, when it



GENÈVE

The Lake, the City, and the Mountains

Photo Swiss Federal Railways

accessible, the mountains offer great difficulties for the construction both of roads and railway tunnels. The big roads across the Alps were built only during the nineteenth century (the first was the Simplon road built by Napoleon and opened in 1805). The first big railway tunnel to be built was the Gotthard Tunnel (1882), which facilitated traffic with Italy; the Abdulla Tunnel followed in 1903, the Simplon Tunnel (France-Italy) in 1906 and the Loetschberg Tunnel in 1913. The number of motor vehicles was 265,000 in 1950, of which 2000 were omnibuses.

Foreign Trade. As already pointed out, Switzerland is compelled to import a large amount of foodstuffs and nearly all raw

amounted to 248·3 million francs. Imports are highest from U.S.A., then follow France, Germany and Great Britain. Among the buyers of Swiss goods, the U.S.A. again takes the first place, then come Italy, Germany and France.

Swiss export trade had been severely hit by the economic nationalism in the 1919-1939 period and especially by the exchange regulations promulgated by Germany, then her best customer, and by Italy. Compelled to devalue the franc even in 1936, Switzerland further suffered for a time in the economic chaos following the second World War when some of her most lucrative markets and best customers had been lost.

As we have shown, the proceeds of Swiss exports are not sufficient to cover the imports. This deficit is made up, apart from the export of electric power not included in the official Trade Returns, mainly from the income from capital investments abroad and by the money which foreign tourists spend in Switzerland.

Visitors to tourist centres numbered 4,364,800 in 1950, including 1,892,900 foreigners in spite of the difficulties imposed by currency restrictions. Holiday-makers are attracted by the Alpine scenery, the climate, and by summer climbing and winter sports.

Summary. Switzerland has become a highly industrialized country since the nineteenth century. Since it cannot become self-supporting in foodstuffs for the present size of its population, it must rely upon industrial exports to find the means to pay for the food-stuffs required from abroad. As water power

is the only natural wealth, industry concentrates on the finishing branches which use highly skilled labour and produce goods of relatively high value from foreign raw materials. Industry has been able to adapt itself to the changing conditions of the world market, old branches declining and new ones being developed.

During the 1939-45 War, although her neutrality was respected, she was surrounded by German-controlled territory and therefore became economically dependent on Germany. Her tourist traffic disappeared, while enormous numbers of war refugees had to be clothed and fed. The Red Cross headquarters at Berne needed a large staff to handle correspondence concerning prisoners of war. At the end of hostilities, Switzerland suffered from the general decline in international trade, but she subsequently enjoyed a boom period.

The Cities of Switzerland

Basle (Bâle). This city is the second largest in Switzerland and occupies a strategic position on the Rhine, between the Jura and the Black Forest, near the northern frontiers. It stands where the roads from Italy, the Rhineland and the North Sea, from Germany and France meet, and is accessible by land and water. It is, naturally, an important trading centre. Basle first comes into history as a Roman outpost in the fourth century. The time of greatest glory was in the fifteenth century, and the city has been a university town since 1460.

There is a long established trade in silk ribbons, in the manufacture of paper and aniline dyes, and there are also tanning and brewing industries. Population (1950 estimate), 183,550.

Berne. The chief city of the canton of Berne and the political capital of the Swiss Confederation, presents a marked contrast to Basle. Situated on a promontory above the River Aar, defended on three sides by the river, it possesses few economic advantages, and its history has been a military rather than a commercial one.

The finest buildings include the Gothic minster, the Church of the Holy Spirit, the Federal Council Buildings and the University. There are numerous old fountains in the old town, a feature which is characteristic of the cities of Switzerland. The famous Bear of Berne is the heraldic cognizance of the city.

The Postal Union has its headquarters here. Industries include the manufacture of woollens, stockings, silks, watches, toys, and cheese. Population (1950 estimate), 146,500.

Fribourg. The capital of the canton of Fribourg stands on the River Sarine, with a high town on the cliffs and a low town by the river. The town presents a medieval appearance, with its ramparts, towers, and picturesque fountains, several of which date from the sixteenth century. The chief buildings are the Church of St. Nicholas, built in 1178, and the Town Hall, which was built in 1505. The town stands on the language frontier; in the upper town French is the prevailing language, and in the lower German. Population, 30,000.

Genève. Situated at the western end of Lac Léman (Lake Geneva), the city is divided by the Rhône into the old town with narrow streets and tall houses and the industrial modern quarter of St. Gervais. The greatest building is the twelfth century cathedral of St. Peter.

In 1919 Genève was selected as the seat of the League of Nations and the permanent office and conference hall of the League were built there. The International Labour Office and the Red Cross Societies still have their headquarters in Genève. Besides possessing cultural and political significance, Genève is an important industrial centre, the chief

manufactures being watches, clocks, and scientific instruments and gold and silver ornaments and jewellery. The people are French speaking. Population (1950 estimate), 145,500.

Interlaken. In the canton of Berne, between Lakes Thun and Brienz, it occupies a flat piece of alluvial land formed by the torrents descending from the Valleys of Grindelwald and



BERNE

Above: A street market. Below: One of the principal thoroughfares

Photos: Swiss Federal Railways, Max Kettel

Lauterbrunnen. Though somewhat relaxing in summer and rather damp in winter, the town is a popular summer pleasure resort. German is spoken. Population, about 4000.

Lausanne. The chief town of the canton of Vaud is situated on the lower slopes of Mont Jorat, on and around five hills, and near Lac Léman. The Gothic cathedral dates from the thirteenth century. Since 1874 the Federal Court of Justice has been situated here. The importance of the city is derived from the educational establishments. Lausanne has a considerable trade, but little industrial activity except in the manufacture of chocolate and tobacco. The people are French speaking. Population (1950 estimate), 106,800.

Luzern (Lucerne). The town stands on the banks of Lake Luzern, the old town being divided from the modern town by the River Reuss. The picturesque medieval town has many notable buildings, chief among which are the sixteenth century Hofkirche and the Town Hall of the same period. An interesting monument is the "Lion of Luzern," a great lion carved in rock commemorating the Swiss Guards who were massacred in the defence of the Tuileries. The modern town is a favourite holiday resort. The people are German speaking. Population (1950 estimate), 60,500.

Neuchâtel. The capital of the canton of Neuchâtel is situated on Lake Neuchâtel, Switzerland's largest lake, near the influx of the Seyon, and lies partly on reclaimed land and partly on a steep slope, crowned by the castle and the collegiate church. Since 1909 Neuchâtel has had her own university, and her educational facilities attract many foreign residents. The most important industries are watchmaking and the manufacture of jewellery and electrical apparatus. The people are French speaking. Population, about 27,500.

Zürich. The largest city in Switzerland and the chief town of its canton, Zürich occupies a striking position on both banks of the River Limmat, at the northern end of Lake Zürich. It has played a part of the first importance in the cultural life of Switzerland. The university founded in 1832, is particularly famous for its medical school. The most important industry is silk weaving; there is also a considerable manufacture of cotton goods and of machinery. Zurich ranks as the chief financial centre of Switzerland and has the most cosmopolitan character of any of the Swiss cities. The official language is German, and the popular dialect is Schweizerdeutsch. Population (1950), 390,000.

THE BALKAN STATES

(Albania, Bulgaria, Greece and Yugoslavia)



A RIVER OF ALBANIA

The Valley of the Suschizza in Valona, showing the narrow strip of fertile land between the hill ranges
Photo Topical

Albania

ALBANIA is the least-known country of Europe. Yet it has been boldly prophesied that within another generation it will be a popular holiday resort. Scenically it can compare with Switzerland and Norway, and in interest it surpasses them both.

The land is almost entirely mountainous. There is a narrow coastal plain, in no place more than twenty miles wide, but the remainder of Albania is a confused medley of mountains

and valleys. Though the mountains do not reach Alpine standards, their height is consistent—there are dozens of peaks between 6000 and 8000 feet above sea-level.

The most attractive corner of Albania is in the north-east, adjoining the Yugoslav frontier. Here are continuous ranges of large granite mountains enclosing green and pleasant valleys: sometimes the scene is lovely, sometimes majestic. Farther south the mountains are still

high, but the valleys are not so secluded. This geographical accident has had a considerable effect on the character of the people.

The People. The origin of the Albanians is obscure. They claim, with some reason, to have been the original inhabitants of the Balkan peninsula, just as the Basques are said to be the descendants of the first occupants of the extreme west of Europe. It is at least certain that the Albanians were in the Balkans long before the



A COUNTRY SCENE

An Albanian peasant woman in national costume and one of the wooden belfries typical of the country

Photo Bernard Newman

Turks, Serbs, Bulgars, or even the Greeks. The mother of Alexander of Macedon was an Albanian. The Albanian tongue proves the antiquity of the race. Although Turkish, Latin, and Slav words have been liberally infused, it is a language quite distinct—just as different in type as is Basque from French.

It is probable that at one time Albanian tribes occupied the whole of the Balkans. Today Albania is a small state not much larger than Wales. Its population is just over one million, but nearly a quarter of a million Albanians live in districts adjacent to the frontier in Yugoslavia, and there is even a colony of Albanians in Italy. These were refugees who fled from the Turks; their descendants have conserved their language and characteristics.

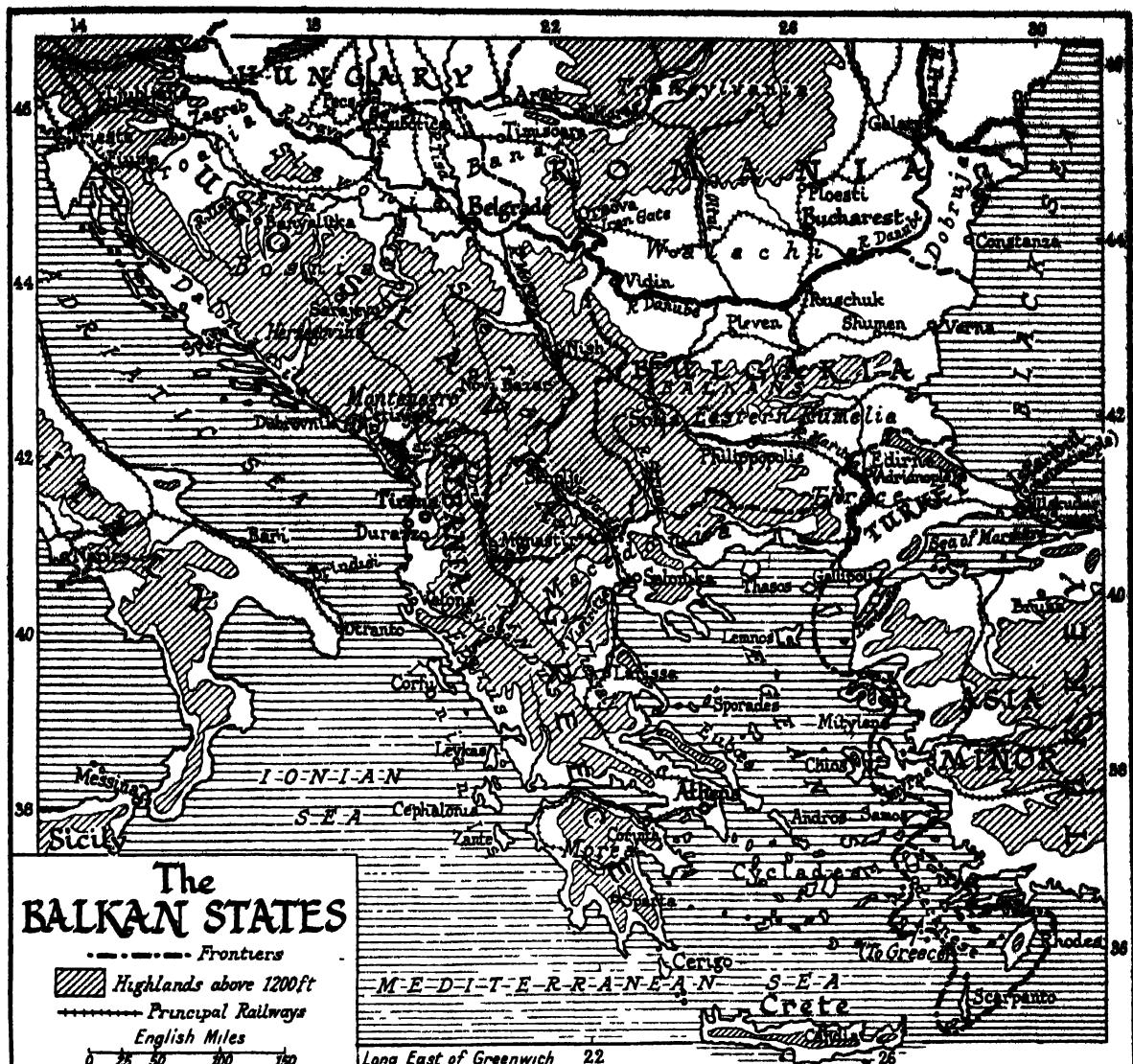
There are two principal branches of the Albanian race. In the north of the country are the Ghegs, in the south the Tosks. The dividing line is the valley of the River Shkumb (Skumbrin), which flows through Elbasan. The physical differences are not striking, but the Tosks have proved more amenable to the advance of civilization. This is due to the geographic cause mentioned above. The valleys of the north are enclosed and remote, but in the south the passes are gentler, and Greek influence has freely penetrated.

Seventy per cent of the Albanians are Mohammedans, 10 per cent Roman Catholics (mostly in the north) and 20 per cent Orthodox (mostly in the south). They are almost entirely a rural people—there are only six towns in Albania with a population of more than 10,000. Even to-day the organization of the country is largely tribal, and the family rather than the individual is the unit. In the mountain valleys—that is, in the greater part of the country—the head of the family wields powers which are almost autocratic. In the north-east corner of Albania, amid the most magnificent scenery of the Balkans, the Gheg tribes live under conditions which have scarcely changed in five centuries.

The Law of Lek and the Vendetta. Although the head of the family has almost autocratic power, life in the high valleys is very uniform, for an ancient code of laws provides rules of conduct for all occasions. These are generally referred to as the "Law of Lek." Lek, who might be termed an Albanian Moses, flourished five centuries ago, but appears to have done little more than codify long-existing customs. The "Law of Lek" is founded upon honour, but in its effects it produces the worst terrors of the vendetta. If you kill my brother, then I must kill you—because my honour is sullied. Your brother in turn must kill me, and so the feud goes on.

The rules of the vendetta are, however, very strict. Women and children are exempt, and no man may be shot if he is in the company of a woman, a child or a stranger. Further, the parties to a vendetta may swear a *besa*, or oath of honour, and be at peace for a fixed period—a saint's day, or the time of getting in the harvest. The moment the *besa* expires desultory and treacherous warfare again begins.

Domestic Architecture. The influence of the vendetta has had its effect on domestic architecture. Albanian mountain homes resemble fortresses rather than farmhouses. They



ALTERNATIVE PLACE NAME SPELLINGS

Athens = Athena; Belgrade = Beograd; Bucharest = Bucuresti; Crete = Krete; Cyclades = Kyklades; Corinth = Korinthos; Chios = Khios; Corfu = Kerkyra; Cephalonia = Kephallenia; Durazzo = Dures, Euboea = Evvoia; Mytilene = Mytilene; Lesbos = Lesvos; Naples = Napoli; Philipopolis = Plovdiv; Salonia = Thessalonike; Scutari = Shkoder; Sofia = Sofiya; Zante = Zakynthos

are solid and substantial: animals occupy the ground floor, humans the first. There are no more than two or three tiny windows, a foot square—intended for shooting purposes rather than ventilation!

Very often the entire male side of a family lives in one house—a father, four or five sons, and their wives and families. The living portion of the house usually consists of one large room. In the middle is a hearth, and the smoke of the fire finds its way out as best it can. There is no furniture except a wooden chest, one or two very low chairs, and a table only six inches high. For meals or rest everyone squats on the

floor. At night bracken is spread over the floor, rugs handed out, and the family goes to "bed," all in the one room. As many as sixty people, men, women and children, sometimes share the same floor.

Living Conditions. The standard of life is not high. For many successive days the entire family will live on maize bread and sour milk. On a saint's day a sheep will be killed and roasted on a spit. The Albanian only grows enough to feed his own family. Why work harder, when it is almost impossible to market his produce? Everything in his valley is home made. Clothing is crude but distinctive, and

entirely a local product. Sheep are sheared, the wool is worked into thread from the distaff, and the women of the house busy themselves with an antique loom till sufficient cloth is woven. There is little attempt at decoration, though the white trousers of the men are always embroidered in black stripes, each tribe having its own pattern. These black stripes are in memory of Skanderbeg, the Albanian national hero who defied the Turks some five hundred years ago.

The Law of Lek governs marriage customs. Children are betrothed when they are babies



TIRANA

The Houses of Parliament with an explanatory inscription above the doorway

Photo Bernard Newman

—sometimes even before they are born! At the age of sixteen the youth will go to demand his bride—though maybe he has never seen her—taking with him the purchase price of cattle. The girl is not compelled to marry him, but she usually does—and marriages are usually happy. If the girl does refuse her appointed man, she must not marry anybody else. If she did, the honour of her rejected swain would be offended, and he would act as directed by the Law of Lek.

Difficulties of Modernization. It should be emphasized that although vendetta killings are justified by the ancient Law of Lek, they are, of course, illegal by the law of the country. The old traditions have been the State's greatest obstacles in the modernization of this little land. Under the supervision of British officers there was established a gendarmerie, with a post every four hours' march. The clansmen of the south and of the plain had by 1938 been persuaded to

disarm. Only among the high mountains of the north are Lek's rules still respected. A generation ago no one thought of harming a vendetta killer—except the opposite parties of the feud. To-day he is arrested by the police—if they can catch him. He is not executed, but gets a long term of imprisonment. Life in a prison cell is torture to a mountaineer.

Some of the better qualities of Lek's code were wisely retained by King Zog, who did not expect to build up a Western state in a day.

Unfortunately for the progress of modernization, Albania was engulfed in the second World War, during which guerilla fighting was carried on over her lands by partisans equipped by the Allies. The lawlessness of guerilla bands seemed to supersede the order that King Zog had been trying to build up. In 1946 a Republic was proclaimed, Zog was forced to abdicate and the country has now come under Russian influence.

Communications. Over great areas of northern Albania there are no roads; many people have never seen a wheeled vehicle (though they have seen plenty of aeroplanes overhead). Some rivers, unbridged, are crossed, supported by inflated goat-skins, officially provided for passing travellers. For her perambulator the Albanian woman slings the wooden cradle on her back, and walks easily along the rough mule track. For conversation, the shepherds make use of the "Albanian telephone." Sticking his thumbs in his ears to stop the drums from bursting, the Albanian shouts in a high pitched key, and his friend will hear him three or four miles away.

Yet it would be quite wrong to present this primitive picture as of the whole of Albania. Forty years ago it would have been entirely accurate. By 1939 it applied only to the north-east corner, where the Government still provided an armed escort for foreign visitors. Over the rest of the country, however, the process of reform was proceeding rapidly. Schools and roads were being built, and public order established. The Mati Valley, just to the south of High Albania, is an excellent example of the transitional stage. It was still the scene of an occasional vendetta murder, but the number had been reduced by 90 per cent; justice was still administered in the traditional manner. The valley is especially interesting because it was the home of King Zog.

To modernize his country King Zog obviously needed money. Only his neighbours were interested—and Yugoslavia was the hereditary

enemy, occupying a province inhabited by Albanians and persistently claimed by Albania. Italy was the obvious alternative. Italian officers trained the new army; Italian money and engineers made possible the new roads. Several million pounds were advanced, without hope of repayment. Italy's compensations were a useful base in case of trouble with Yugoslavia, and Albania's oil.

Exports and Resources. Exports are scanty. We have already seen that the peasant tribesman only grows enough for his own use. There are practically no manufactures in the

turbulent mountain streams, are useless for commerce, but the coast has several natural harbours.

Towns. As might be expected in such a country, the towns are comparatively unimportant. The first capital was the port of Dures (Durazzo), but the seat of government was then moved to Tirana, thirty miles inland. Tirana is little more than an over-grown village, the new official quarter side by side with squalid hovels and narrow cobbled alleys. Even the main streets exhibit strong contrasts—the Rolls-Royce of a foreign diplomat and the



COUNTRY TYPES OF ALBANIA

1 Albanian telephone 2 Albanian greeting 3 Albanian transport
Photos Bernard Newman

whole country, except for domestic industries such as tanning and milling. There are small exports of cattle and timber, and in 1951 the production of petroleum advanced to 260,000 tons. The geological survey of Albania has never been completed, but it is certain that considerable mineral deposits exist among the mountains. Coal, iron, bitumen, copper, chromite and salt have been worked in spasmodic fashion, but the scientific exploitation of the mineral wealth has not yet begun; nor can it until communications are much improved. In 1940 work on the first railway in the country was commenced. Even the new roads were primarily designed for heavy military traffic and their surfaces are generally rough. The rivers, mostly short and

lumbering wooden wagon drawn by a team of buffaloes side by side. The House of Parliament was once a casino, built for the pleasure of Italian officers.

Far more interesting is the ancient city of Elbasan, on the Shkumb, the mountain stream which divides the Ghegs from the Tosks. Elbasan was known to travellers when the rest of Albania was a sealed book, for the ancient *Via Ignatia* ran from Dures through Elbasan towards Salonika. Elbasan is almost entirely Mohammedan. Houses and gardens are surrounded by high walls, so that the women may be sheltered from the public gaze, and women in the streets are always veiled (in Tirana and the south the practice is rapidly dying out—indeed, the veil was officially banned in King

Zog's reign). The bazaar is incredibly Eastern, a maze of tiny shops like wooden boxes, their owners squatting among their wares. The public letter writer does a flourishing business, for few of the older generation can read or write.

Korche (Koritza), in the extreme east, near the Greek frontier, is the third largest town of Albania. It has been described as the "Manchester of Albania," but the comparison is slightly strained. The town has no more than 23,000 inhabitants, and is the centre of the most fertile region of Albania. Except that many of its people wear rather shoddy western clothes in place of the picturesque national costume, it has none of the signs of a manufacturing town, and most of its "factories" are primitive, the products being used locally.

Berat, the capital of the Tosk country, is really two towns. On a precipitous hill, enclosed by ancient walls, live a few hundred Christian families; below, in the valley, is a more modern town inhabited by Mohammedans.

The principal town of the north is Shkoder (Scutari), on the banks of Lake Shkodres (Scutari). The castle was the centre of the famous siege of 1912-13, and its ruins dominate the old town. Scutari is the headquarters of Roman Catholic influence in Albania, and is the natural capital of High Albania.

A tour of its towns, however, gives quite a wrong impression of Albania. Most of them lie on or near the coastal plain, and this could never be classed as the real Albania. Foreign invaders succeeded one another—Greeks, Romans, Goths, Serbs, Bulgars, Venetians, and Turks claimed mastery, but in each case their power ended where the wild mountains began. (Under the Turkish regime, the post of tax-gatherer in Albania was held to be the most dangerous job in the Sultan's domain!) Ninety per cent of the people live among the mountains—most of them in houses so scattered that they can scarcely be described as forming villages.

In the Interior. Imagine a green valley, maybe a mile or two wide, its floor covered by maize fields. Scattered over a great area, a quarter of a mile from each other, are a hundred solid stone houses, each capable of sheltering an entire family: the valley is occupied by a single clan, under a hereditary chief. Flanking the maize fields are green hills, on which wander flocks of sheep, guarded against the attacks of wolves by armed shepherds. When the grass land—held in common by the clan—fails to satisfy requirements, boys climb the

trees and throw down branches of oak leaves to the sheep and Liliputian mountain cattle below. Beyond the hills are real mountains—ranges of shaggy grey mountains, massive and forbidding. They know no human inhabitants, except perhaps a fugitive from vendetta "justice" or the more modern discipline of police administration.

The police post, with its telephone wire, is the only touch of civilization. The clansmen need no new-fangled devices to talk to each other across the valley, and their shrill cries are continually heard. Materially, the valley is remarkably self-contained. As the women walk down its rustic path beside the rushing stream their fingers are busy with the distaff, and from a cottage comes the sharp clack-clack of the loom. There may be a school somewhere in the valley, which the children attend spasmodically, when not required for work in the fields or with the flocks.

One would search almost in vain for what is called culture. Of music there is little or none: in the south one might encounter a travelling gipsy band of musicians, but the north knows no more than wailing folk-songs. There are ancient stories handed down from generation to generation. In the north dancing is almost unknown, and the costumes of the people are substantial rather than decorative. In the south Greek influence has modified native ideas. Superstition is rife. An Albanian tribesman, fearless in battle, engaged without tremor in a deadly feud, is often afraid to go out in the dark!

Except for the occasional excitement of a vendetta, nothing ever happens in an Albanian valley, so it would appear from the slow tempo of change. An Albanian Rip Van Winkle would return to his valley and scarcely note any trace of the passing of the years. The seasons come and go, the crops are successes or failures: there are marriages, births and deaths. The face of the valley and the character of its people remain unchanged. In the years to come the minds of the people must be affected by the atmosphere of change emanating from the towns of the coastal plain, and it may be that in the course of a few generations the Albanians will lose much of their individuality under the constant process of Westernization. Already, under Soviet influence, there is the inevitable Five-Year Plan, but many decades must happily pass before the most energetic onslaught of industrialization can spoil the glorious mountain scenes of High Albania.



PANAGYURISSTE, BULGARIA

A panoramic view of the town with the Sredna Gora Mountains in the background

Photo: Bernard Newman

Bulgaria

IT is a curious fact that most English people who have spent any considerable time in south-eastern Europe become violent partisans of one or other of the Balkan countries against all the rest. Bulgaria has had more than its proportionate share of English supporters. Sofiya (Sofia), the capital, once named one of its main streets after Mr. Gladstone and another after two English brothers who are still living, and the finest Bulgarian cigarettes are named after a famous correspondent of *The Times*.

The chief clue to this political partisanship is in the history of the country since its struggle for freedom against Turkish domination over seventy years ago, and another factor is the extraordinary fascination of the countryside and of many of the small towns; but the chief attraction of Bulgaria is probably to be found in the character of its people. In neighbouring countries the Bulgarians are often described, half in contempt, half in envy and admiration, as the Scots of the Balkans, and there is a good deal of truth in this description. With less superficial charm than their more volatile neighbours, with little of the grace and beauty of the Dalmatian people, with even less of the easy and quick intimacy of the Greeks, the

Bulgarians appear stolid, earnest and tenacious. Often they appear to be careful to the point of meanness, calculating and selfish, but the foreigner who breaks down their first suspicions finds them invariably hospitable and generous. Like the Scots, they attach great importance to education and the standard of literacy is much higher than in any other country with a comparable standard of living, while Sofiya University, with its new School of Agriculture drawing students from abroad as well as from tiny farms and remote villages, has established a standard of scholarship that is really remarkable in relation to its short history.

The traveller who approaches Bulgaria from the west has a choice of two routes: the quicker by train or road through Beograd (Belgrade) and Niš, with Sofiya only an hour or so on the other side of the frontier. The slower, but far more interesting, approach is to travel down the Danube by one of the luxurious river boats that make the journey several times a week during the late spring and summer. In this way it is possible to glimpse the magnificent scenery of the Iron Gates and to enter Bulgaria at Lom or at some other of its river ports. Lom is a small town, interesting chiefly because it is typical of the newer Bulgarian

towns, with low cream-washed houses between avenues of acacias, and garden restaurants where characteristic Bulgarian dishes are cooked on open charcoal grills beneath the trees.

The journey from Lom to Sofiya, through the beautiful Iskra Gorge, illustrates another typical aspect of the scenery of northern Bulgaria, where a number of rivers, of which the Iskra and the Yantra are the largest, flow into the Danube in deep channels through a countryside which alternates between cultivated fields and orchards and bare tracts of downland where an occasional shepherd, patriarchal with his heavy cloak of cream and brown homespun and long crook, can be glimpsed among his flock.

The Capital City. Sofiya, with a population of rather more than 435,000, is one of the smallest of European capitals. Its situation, on a high and almost level plateau encircled by steep mountain ranges, is startlingly picturesque. In summer the Vitosha Mountain, so close to the town as to appear at times almost to overhang it, provides a protective screen that often creates a suffocating heat. In spring and autumn the climate is fresh and pleasant, and in winter months there is sufficient snow to make skiing a common week-end pastime for the well-to-do.

Architecturally the town is undistinguished. Few buildings remain from the time before the Liberation of Bulgaria in 1878, and a great many new buildings, flats, hotels and offices, are built chiefly in the style that was fashionable in Germany immediately after the first World War. The older buildings, particularly the former king's palace in the centre of the

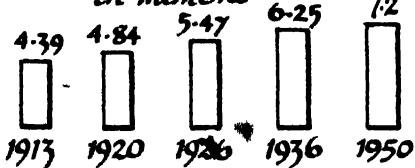
town, and the main street leading from it to the Sobranie, are pleasant and dignified with their facings of pale yellow stucco. Lying off the main street is the great Tsar Osvoboditel Cathedral named after the Russian Emperor Alexander, the tsar liberator, in gratitude for the part played by Russia in the expulsion of the Turks. In striking contrast is the small jewel-like Russian church, the one indubitably beautiful building that Sofiya possesses. The golden dome of the Cathedral forms a landmark to the surrounding countryside, but the building itself is dull and the mural paintings with which the interior is decorated of no outstanding merit. A second cathedral, Sveta Nedelya, has only recently been rebuilt after having been destroyed by bombs a few years after the first World War.

But what Sofiya lacks in historic monuments it more than compensates for in the vividness of its life. There are several really excellent hotels and a number of second class hotels that are both good and cheap; the town is peppered with small restaurants, cafes and bars where native spirits are served as *aperitifs* with a variety of *hors-d'oeuvres* that to a western appetite are a meal in themselves. The few large "first class" restaurants are European rather than Bulgarian in character and cuisine, and not outstandingly good of their kind; the smaller restaurants offer a variety of typical Bulgarian dishes from red Danube caviar to the delicious grills, rissottos and paprika stews that are found with variations all over the Balkans. In addition there are several cheap and interesting vegetarian restaurants and many little "milk bars," whose clientele eat a

BULGARIA

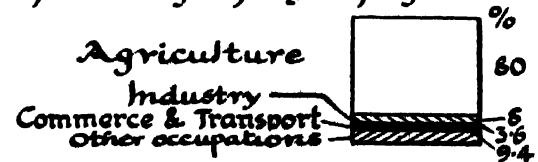
POPULATION

in millions



Occupational Distribution

In percentages of total number of persons gainfully employed



IMPORTS

Classified in percentages according to countries of origin and destination



EXPORTS

Classified in percentages according to countries of origin and destination





SOFIYA

The Military Club, an example of modern architecture in the capital
Photo Fox

surprising number of hard boiled eggs at a sitting, and an equally surprising quantity of the sour milk which is celebrated all over the world for its health giving properties.

The social and intellectual life of the town is lively and varied. In the National Theatre and the several smaller theatres it is possible within the space of a week or so to see Shakespeare, grand opera, Russian ballet and a play concerned with Bulgarian life and customs: there are frequent exhibitions by Bulgarian painters, meetings of scientific and literary societies, and a real, if self-conscious, attempt (fostered perhaps as much by national pride as by enthusiasm for the arts) to give the capital of the country something of the cosmopolitan culture that springs naturally only from an older foundation.

Although Sofiya is becoming increasingly Westernized it still retains some of its more primitive characteristics; among the townspeople in their western European dress there are generally to be seen a sprinkling of peasants from the surrounding countryside, the men in tight breeches and home-made sandals fastened with leather thongs, and wearing sheepskin jackets with the fur on the inner side, the women dressed in many thicknesses of cotton or woollen cloth, with wide skirts.

Albanian sellers of *boza*, a sweet drink very popular all over Bulgaria, are to be seen in every street, wearing a red fez and carrying two glasses, water to rinse them, and a long spouted metal pot. On feast days the crowds will contain a sprinkling of peasants from more

remote districts where the richly embroidered costumes that are handed down from one generation to another have not yet been abandoned for the monotony of western European dress.

The most interesting festival is that in honour of St. Cyril and St. Methodius who, it is said, together invented the Cyrillic alphabet and so began the education not only of Bulgarians but of Serbs and Russians as well. The day is celebrated with processions of Bulgarian youth, from the tiny children of the elementary schools to University students, dressed in a variety of native costume or in the uniforms of the numerous youth organizations.

Sofiya has few industries and most of the population are engaged in the administrative work of the Government, or in the trades that grew with the city's development after the first War. The essentially peasant character of the country is seen even in the capital, where few people are more than two generations removed from the life of the small farmer.

Predominance of Agriculture. To-day 80 per cent of the people of the country earn their living from the soil; with a population of some 7,200,000, Bulgaria has about 1,000,000 peasant proprietors. Since 1945 land ownership has been limited to 20 hectares (49·4 acres). The average holding is very small: 87 per cent are less than ten hectares in extent and over 45 per cent are less than two hectares.

Bulgaria has been called "the land without a farmhouse," and the description sums up one



SOFIYA

The Alexander Nevski Church
Photo · Planus

of the outstanding features of a country where most of the population live in compact villages and small towns and have to travel considerable distances to their little farms. A law of inheritance that had been in operation since 1890 decreed that on the death of the father his property should be divided equally among his children. This was amended in 1906 to allow a son to have twice as much as a daughter. The effect of this method of inheritance has been to divide individual properties into smaller and smaller separate holdings, and the average peasant may have six or more patches of land scattered around the village, some near his home, some several miles apart. It is unnecessary to emphasize the waste of time and effort that such a system entails or the difficulties that it puts in the way of any attempt to modernize agricultural technique.

After the end of the first World War provision was made to legalize the exchange of property and the consolidation of holdings where over half the members of a commune were prepared to demand such a scheme. At the same time laws were passed with the object of dividing part of the few remaining large estates among peasants whose holdings were too small to provide a livelihood. Altogether about 165,000 hectares have been divided in this way.

The standard of living in the country is low and the ordinary peasant family has to work regularly and hard for its meagre subsistence. The typical peasant home is of one or two rooms with earthen floors and white-washed walls and an out-house or so for the animals.

The more substantial houses of the richer peasants are often of Turkish type, two storied and either half-timbered or built entirely of wood; the windowless lower floor is generally used for storage and stabling, and a projecting upper floor serves for living accommodation. Many of these houses are of considerable beauty, and the interiors of the homes are occasionally decorated with handsome carved ceilings and, more frequently, hung with native carpets and embroideries. The main room of the smaller houses will frequently contain little but a bed, a table and a handloom on which much of the family clothing is still woven. The outsides of the houses are decorated with festoons of red peppers hung to dry for the winter.

Principal Crops. Very little is bought and sold in the smaller villages. The small peasant

produces for his own needs and often has little surplus to send to market. The richer peasant may market a substantial proportion of his annual yield, wheat, barley, maize and other cereals, tobacco, fresh vegetables and fruit. A strong co-operative movement assists its members in marketing, buying seeds and tools, and makes loans; but in general it is true to say that the potentialities of the soil are only inadequately developed. Output of many agricultural crops is smaller in quantity and poorer in quality than the natural advantages of the country would suggest.

The difficulty of introducing modern methods of cultivation which require some capital investment in tools, fertilizers and new types of seed is aggravated by the system of land tenure and by the large part of the working day that the peasant is obliged to spend in travelling to and from his work and from one holding to another. Women work as hard or harder than men, and it is common at dusk to see husband and wife returning from the fields together, he resting on the high farm cart, she leading the animals or walking beside them plying her distaff.

The most important agricultural products are tobacco and attar of roses.

Tobacco. Tobacco is believed to have been introduced into Bulgaria from Turkey in the thirteenth century. Until 1913 it was grown mainly for local consumption and the small quantity exported passed into the world market as being of Turkish or Greek origin. By the treaty that terminated the first Balkan War in 1913 Bulgaria acquired a number of tobacco growing districts, chiefly in Macedonia. The outbreak of the first World War gave an impetus to production to meet the demands of the Central Powers, particularly after the entry of Bulgaria into the struggle, and during the war years tobacco exports grew to substantial proportions.

By the Treaty of Neuilly in 1919 Bulgaria lost a part of the territory acquired in 1913, but the subsequent war between Greece and Turkey provided compensation in terms of trade for territorial losses, and Bulgarian tobacco for a time replaced that of Greece and Turkey in the world market. Tobacco now forms 80 per cent of the country's total exports, though tobacco growers still find it easier to market their product as Greek or Turkish rather than Bulgarian. Tobacco is now grown in most parts of the country with the exception of south-west Bulgaria, the neighbourhood of

Sofiya, and the northern slopes of the central Balkan chain.

The main centres of production are Doupnitsa, Gorna-Dzhumaya, Plovdiv and Petritch. Plovdiv, the ancient Philippopolis, has a larger industrial population than any other Bulgarian town, most of which is employed in the preparation of tobacco for export and the manufacture of cigarettes. Bulgarian tobaccos are of very good quality, and Bulgarian cigarettes are among the best in the world.

The Valley of the Roses. The world famous Valley of Roses covers a district eighty miles in length and thirty miles in breadth between the Stara Planina and Sredna Gora ranges. After the 1914-18 War the total acreage devoted to rose cultivation declined because of the substitution of cheaper ingredients for all but the most valuable perfumes. At one time attar of roses was literally worth its weight in gold. Then the price fell to about £2 an ounce.

At the end of May and the beginning of June the valley offers a sight of extraordinary beauty. Local peasant women, heavily clad in picturesque costume and with white head-dresses covering their dark hair, gather the roses in the early morning before the dew has dried. The roses are almost entirely confined to two varieties, one red and one white. About one thousand roses make up one kilogram in weight. Three and a half kilograms make on the average about one gramme of the essence. A number of the old type of stills are in use in the valley, but five-sixths of the distilling is done by modern methods in efficient plants now that this industry—like most others—has been nationalized. Strict methods are employed by the Government to ensure the purity of the product, and in recent years there has been a distinct improvement in quality.

Bulgaria's other exports are confined almost exclusively to agricultural products in their



AVENEZEE MAXUA AND THE YANTRA VALLEY
A general view showing a village near the Turkish frontier

Photo Keystone



IN THE DISTRICT OF PRAVADIA
A Bulgarian peasant dance in national costume
Photo Topical

raw state, chiefly cereals, fruit and vegetables. The spread of agricultural education after the first World War brought about a striking improvement in the quality of many crops. The early-ripening grapes of the country fetched a sufficiently high price to make their transport by air to Berlin and other towns in central Europe profitable for a short season each year. In the last few years before 1939 England had begun to import Bulgarian grapes. The experimental work on State farms is improving the quality of cereals and leading to the spread of scientific cattle breeding.

The State farms play an important part in the economy of the country, not only in conducting scientific researches, and in training agricultural advisers to act as pioneers in backward districts, but also in direct propaganda among the peasants. Important researches in the breeding of rust-resisting types of wheat are carried out at Obraztov-Tchiflik ("Model Farm") near Ruse (Ruschuk) in northern Bulgaria. Peasants from neighbouring villages are regular visitors to the farm, and take a real interest in its work. Similarly a large cattle-breeding station near Shumen, the long established centre of the Mohammedan districts, is experimenting in the cross-breeding

of the hardy native cattle with beasts imported from Denmark and Switzerland.

The Towns. Apart from Plovdiv, the centre of the tobacco trade, there is no industrial town of any considerable size. Gabrovo, formerly famous for the manufacture of the black woollen braid used to trim the typical peasant costume, now has a small textile industry. It is a picturesque and rather dirty town with the still predominantly rural character that gives most Bulgarian towns their chief charm. Vines sprawl over the porches of the wooden houses, but the poverty of the industrial workers can be seen in the narrow alleyways and small dark shops where the products of cottage industry—painted toys and wooden boxes in traditional designs—are sold for a fraction of the price they would command elsewhere.

The most beautiful of Bulgaria's many picturesque little towns is Tirnovo, the ancient capital. Built around a number of sharp bends in the Yantra River, its natural situation is incomparably lovely. The river flows in a deep gorge, and above it the town rises in terrace after terrace of painted houses of the old Turkish type. Here the visitor can eat in a restaurant that hangs right over the gorge,

and sleep for a night very cheaply in an immaculately clean Tourist Hostel that lies just outside the town, commanding superb views. Nearby is the Preobezhensky Monastery, one of the centres where Bulgarian culture was preserved during the centuries of Turkish rule.

The Bulgarian Orthodox Church (which differs in several minor respects and points of doctrine from the Greek Church), plays an important part in the life of the people. The handsome bearded priests, with little more education than the peasants themselves, are not less influential in village life because they can marry and own land. This in some sense brings them closer to the life around them than happens to village priests in Catholic countries. But if the ordinary priest has little education, the Church has contributed a great deal to national life. Rila Monastery, hidden in the fastnesses of the mountains, is still the centre of pilgrimages from all over Bulgaria. Nowadays the pilgrims come by train, but they still sleep in the monastery itself, and Rila is the only monastery in the country which allows women guests to sleep within its precincts.

Almost as well known outside Bulgaria as Rila is the town of Varna on the Black Sea. Formerly the port from which the grain of the Dobrudja was exported, it suffered severely

when the treaties of 1919 gave the Dobrudja to Romania. Now it has developed as a holiday resort and its direct railway connections with central Europe used to bring streams of summer visitors from Poland, Germany and Czechoslovakia. Burgas became Bulgaria's chief commercial port, and the railway line that links it with Plovdiv and Sofiya made it the centre of Bulgaria's export trade. Like other grain exporting centres Burgas suffered heavily in the world economic depression, but it is now a thriving centre.

The present state of political tension within the country makes Bulgaria's future somewhat uncertain. In 1932 parliamentary government was suspended and Bulgaria came under a dictatorship. After the second World War a "democratic" republic was proclaimed and the king forced to leave. Control, however, came into the hands of the Communists after an election in which the opposition was terrorized, and subsequently, in 1947, opposition was removed by force. The development of Bulgaria's economic resources is so closely bound up with the need to find markets for her agricultural products that the problem of her political alignments in international affairs has to be solved before prosperity can be brought within sight.

Greece

IN the Balkan countries each step towards national independence has been accompanied by changes, not only in frontiers, but, sometimes, by even greater changes in racial characteristics, in trade, finance, and in the organization of both industry and agriculture. In Greece the process of national consolidation covered nearly a century from the Protocol of London which recognized the first territorial independence of Turkish rule in 1830 to the Treaty of Lausanne in 1923, which defined the last. The political expansion of Greece has not been uninterrupted, but her present frontiers have not changed since 1923, the end of an unsuccessful campaign against Turkey. The only important gains that she made after the 1939-45 War were the Dodecanese Islands.

The decade that passed between the Balkan Wars and the Lausanne Treaty saw a popula-

tion migration at least as important as the territorial changes which occurred in that period. The Greek people, who were scattered as traders and farmers in Asia Minor and along the shores of the eastern Mediterranean, returned to Greece as refugees, while the non-Greek populations of western Thrace and other parts of Greece were obliged to return to their own countries. To-day Greece is faced with a minorities problem only in Macedonia, but the difficulties that arise from the almost legendary mixture of races in Greek Macedonia are not made any easier of solution by the fact that both Yugoslavia and Bulgaria are faced with similar problems.

It is estimated that 1,350,000 Greek refugees from Asia Minor settled in Macedonia, Thrace and other parts of Greece between 1912 and 1925. No country has ever had a problem of



GREEK SOLDIERS
Photo: Orient Line

greater magnitude in relation to its resources. Most of the refugees arrived without any means of their own; often they were in rags, starving, ill with typhus or other epidemic diseases. Yet after little more than ten years they ceased to be a liability and had become one of the main assets in the development of their country. They started new industries and modernized old processes, revived the countryside and built new towns. In the past it had always been the most adventurous who went abroad to seek their fortunes; it is the fortunelss descendants of those adventurers who are now among the greatest contributors to the growing wealth of Greece.

To-day Greece has a total area of 51,182 square miles and a population of about 7,600,000. The only traditional Greek lands that lie outside the present frontiers are the Aegean islands, the ex-Italian Dodecanese islands, and the Rabbit Islands which are still held by Turkey as vital to the defence of the Dardanelles. Krete (Crete), the southern limit of modern Greece, lies a little south of

latitude thirty-five, while Thrace approaches latitude forty-one: thus the whole country lies between the latitudes of Roma and Sicily. The differences in land formation between Greece and Italy lead, however, to striking differences in climate and cultivation. The north-to-south direction of the chief mountain ranges affords little protection from trans-continental winds; consequently northern Greece has cold winters that prevent the cultivation of oranges and other fruits that in Italy grow even farther to the north.

Five Geographical Regions. Greece is divisible into five marked geographical regions: the Aegean Islands, the Kyklades (Cyclades) and Krete; the Pelopponesos (Morea); central Greece: the northern part of the peninsula, including Thessalonike and Ioannina (Epiros); and Greek Macedonia and Thrace. Landscape, cultivation and the ways of life of the people vary in certain essential particulars from one district to another. These divisions indicate, moreover, the stages of national expansion through which the country has passed in the last century. The first two divisions (with the exception of Krete) formed the Greece of 1830, and the southern part of central Greece was added two years later. The Ionian Islands were ceded from British protection in 1863, and the northern part of the peninsula and Thessalonike were added in 1881. Through the Balkan Wars Greece succeeded in adding to its territory southern Macedonia, Thrace and Ioannina, as well as Krete and most of the eastern islands. Eastern Thrace was returned to Turkey in the Lausanne settlement of 1923.

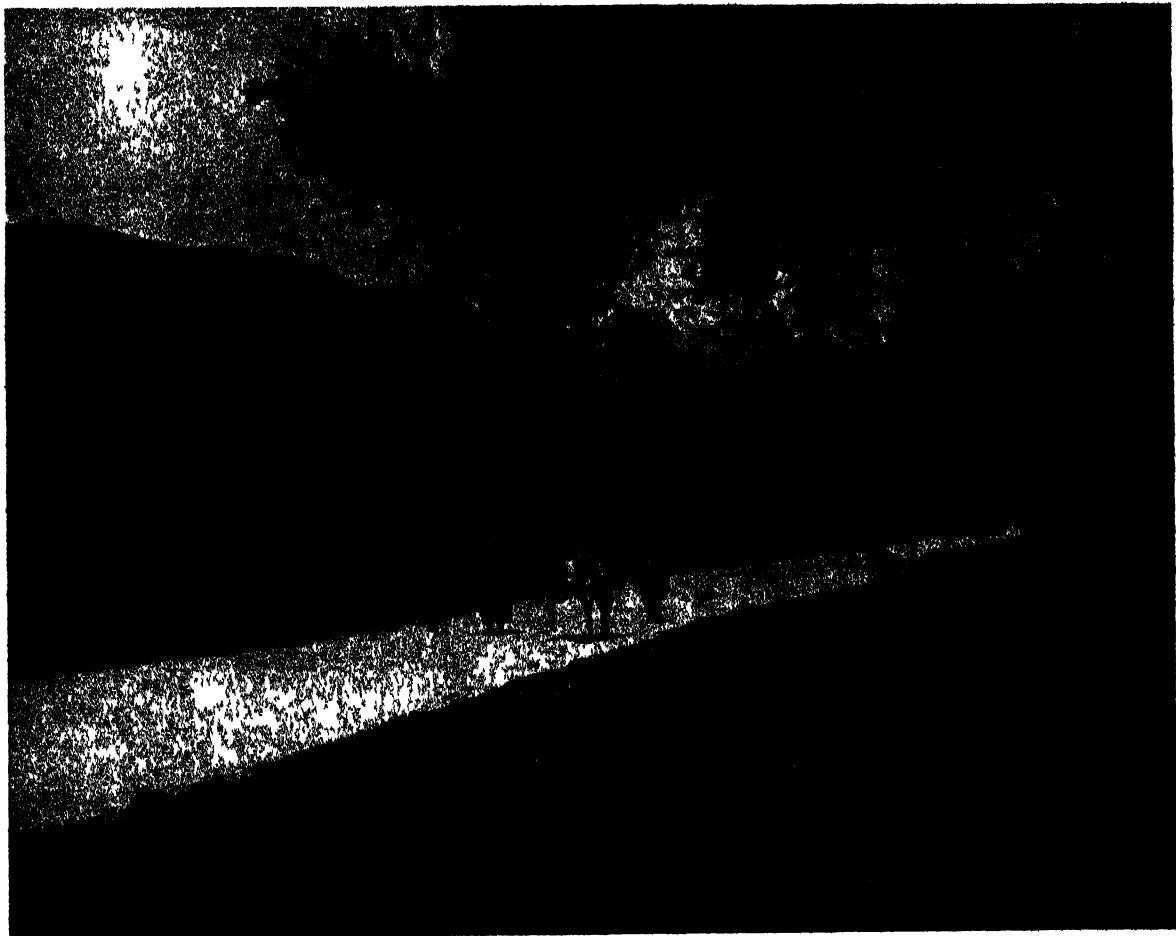
The origins of Greek culture have been traced by archaeologists to two divergent sources, Krete and the Kyklades. Modern



THE MODERN ARENA AT ATHENAI
Photo: Blue Star Line

Krete's chief distinction consists in having been the home of Venezelos, the only Greek statesman since ancient times to have become celebrated outside his own country. The people of Krete live chiefly as peasants, producing cereals, grapes, sultanas and olives, and the island is one of the main centres of sponge-fishing in the Mediterranean.

with an unusual number of natural harbours; narrow lowlands, not especially fertile but capable, with intensive cultivation, of yielding the typical foodstuffs of all Mediterranean people, wheat, vines, citrus fruits, nuts and olives; and hills, apparently barren, offering sufficient pasture for the beasts of a population that relied for its livelihood as much on



ON THE ROAD TO DELPHI

A rural scene among the olive orchards where the pony and the ass are the beasts of burden, and the mountains dominate the valley

Photo. Wide World

It was in the smaller islands of the Kyklades that Greek culture in the widest and most general sense originated in ancient times, and here too, when foreign invaders have stamped out much of the culture of the Greek mainland, the ancient spirit of the people has been again and again revived.

A rare combination of geographical factors has contributed to create the material basis of Greek civilization: a large number of small islands within easy reach of each other and

trade as on agriculture. It is, in fact, the three-fold combination of agriculture, trade and fishing that has given Greece many of its especial qualities and accounts for the apparently contradictory characteristics of its people.

Relation of Ancient and Modern Greece. The classical scholar is apt to regard the modern Greeks as a degenerate race whose relation with the Greeks of ancient times has been rendered doubtful by the influx of non-Greek peoples after the decline of Greek

civilization. A reflection of this attitude can be seen in the way in which educated Greeks regard the problem of the Greek language: modern Greek, which differs in certain essential ways from the classical language, has in the past been divided into the language of the learned, used for literature and even for newspaper articles of the more serious kind, and the language of the people. Heated and often bitter controversy has raged over the respective merits of the two and it is only quite recently that the spoken tongue of the ordinary man

points. Presently Turkish coffee is brought in and, if a proper atmosphere has been created, the conversation will probably turn to general topics, the discussion of international affairs or the ventilation of minor local grievances. Then if the customer is a foreigner he will perhaps photograph the family or some member of the family may photograph him. Then the bargaining process begins in earnest and finally its conclusion is celebrated with more coffee or with small glasses of *mastika*. An appreciation of the part that functions of this kind play in social life is essential to an understanding of the Greek townspeople.

Peasant Farmers and Fishermen. The ancient Greek types still survive on many of the islands. To-day the inhabitants are mainly small peasant farmers and fishermen. Cultivation is essentially primitive, and the wooden plough, still common in mainland Greece, is used almost universally in the islands. The gorgeous (though often unpalatable) Mediterranean fish form an important part of the dietary of the island people, though the slightest unfavourable change in the wind will often prevent the fishing fleet from putting out. Meat is a rare luxury; bread, olives and vegetable stews form the staple diet. The importance of the islands as trading centres declined substantially after the 1914-18 War. The islanders are still often town-dwellers, living closely huddled together in a single moderate sized town and going out daily to their scattered holdings. Towns are generally built on rocky land that is useless for agricultural purposes, and on ancient sites chosen, as protection from pirates, so as to be invisible from the sea.

and woman has been accepted for practically all purposes.

The Greek people of to-day possess many qualities that are at once attractive and admirable. They are quick-witted, intelligent, hospitable and friendly. Fiercely patriotic, their patriotism is sometimes apt to degenerate into a form of political controversy that is peculiarly fruitless.

Aptitude for commerce has given the Greeks a reputation for almost oriental cunning in the driving of bargains, and indeed it is often difficult for western people to realize the almost artistic pleasure that can be derived from an hour or two spent haggling over an article of little intrinsic worth. To go into a small shop in one of the smaller towns is to learn something of bargaining for its own sake. The customer examines the object that has attracted his attention while the shop-keeper discusses its



THE FALLS OF SEBENIK
Photo: Fox

Only the larger and more celebrated islands have any amenities, or even comforts, for foreigners and visitors from the mainland. The traveller who wishes to visit the smaller and less known islands has to endure inconvenience, discomfort, and, above all, dirt. In the primitive village inns there is often a single bedroom in which all the guests are expected to sleep, but the host is generally as friendly as his *confrères* in the big towns and generally much less rapacious. The extraordinary and varied beauty of the islands is adequate reward for much physical discomfort. In the smaller islands customs that have died out on the mainland still survive. Peasant costumes are giving place to western European dress and on the mainland are rare, and except at weddings and festivals are hardly ever seen; in the islands they are a little more common.

though even in remote places they are worn chiefly by the elderly.

Athenai and the Peiraieus. To approach Athenai (Athens) from the sea is an experience unparalleled in the world. Athenai and the port of Peiraieus (Piraeus) are now joined by an electric railway and form for most purposes a single unit. At the time of the Greek War of Independence Athenai had decayed into a small ramshackle village huddled around the northern and eastern slopes of the Acropolis. Its choice as the capital of modern Greece was dictated by historical associations rather than by any outstanding geographical advantages. In the past century it has developed into a handsome modern town with wide streets, well designed squares and boulevards and public gardens. Its development after the 1914-18 War has been particularly rapid, and to-day the combined population of Athenai and the Peiraieus is three-quarters of a million. The Athens of a century ago can still be traced in the contrast between the tortuous narrow lanes of the old town and the skilful planning of the new. Since 1922 several additional suburbs have sprung up to house the refugee population who contributed substantially to the rapid economic development that was still taking place up till 1939.

Modern Athenai and the Peiraieus together form one of the chief banking and mercantile centres of the Near East, and the Peiraieus has a great *entrepôt* trade with the Levant. The main exports are oil, tobacco, marble, wine and cognac, the chief imports grain, coal and manufactured goods. High tariff walls have stimulated Greek industry. The Peiraieus has shipbuilding and engineering works, and the large industrial population is employed in cloth and cotton mills, potteries, carpet factories (which are almost exclusively in the hands of refugees), breweries, distilleries, flour-mills, soap factories, and chemical works. After the 1939-45 War it was barely recognisable as a port. Jetties had been demolished, warehouses razed to the ground, cranes and other installations left twisted and useless. Yet trade with the Levant goes on and out of the ruins the harbour has started again.

But there are gains, to the stranger as well as to the Greeks themselves, that compensate at least to some extent for the losses. Modern Athenai is a busy, noisy city, but it is gay and very much alive. It has delightful garden restaurants where the stranger can choose between the excitement of sampling native



SCENES OF COUNTRY LIFE IN GREECE

1. Washing day at a peasant's cottage.
2. The village of Mistra.
3. The shepherd of the plains.

Photos: Fox; Keystone

dishes and the comparative safety of orthodox European food. There are several excellent hotels, and a number of theatres, cinemas and cabarets as well as occasional festivals.

Athenai in developing as a modern town has also begun to take a greater interest than ever before in its own antiquities. Greek philanthropists have spent enormous sums of money on works of preservation and restoration. Some years ago the Stadium was re-faced with



FISHING BOATS IN THE GULF OF CORINTH
Photo Keystone

marble at the expense of a wealthy Greek of Alexandria, and the first Olympic Games of modern times were played there in 1906. The National Museum and the Acropolis Museum are particularly fine. It is probably true to say that most Greeks, however low their general level of education, have some conscious pride in the remains of classical times.

Education and Religion. The University of Athenai is of growing importance. The general level of education in Greece is low and the percentage of illiteracy high. Greek law declares elementary education to be free and compulsory, but in fact there are insufficient schools throughout the country and it is not difficult for the children in country districts to evade going to school altogether. Graduates of the University of Athenai are gradually raising the standard of the ordinary teachers and technical schools are developing in Athenai,

Thessalonike and elsewhere to meet the new demands of industry.

The Greek Orthodox Church was an important factor in the preservation of Greek culture during the centuries of Turkish rule. The modern Cathedral of Athenai, the focal point of Greek religious life, possesses little interest as a building, but many of the smaller churches both in the capital and in the provinces are very beautiful. The village priests are often little better educated than their parishioners and sometimes almost completely illiterate. Although the church is supported by the State the salaries of village priests are often so low as to make it necessary for them to earn a part of their income by some sort of secular work, and they generally have a field or two and a little patch of olives.

The monasteries, on the other hand, were in the past celebrated for their learning but, though most of them still survive, it is a long time since they have contributed anything of value to the intellectual life of the country. Aigion Oros (Mount Athos), in north-eastern Greece, is one of the most famous monastic communities in the world, with its twenty monasteries belonging to Greek, Bulgarian, Russian and Serbian branches of the Orthodox Church, ruled by an elected assembly of their members. Stringent regulations are imposed to prevent any female—human or animal—from approaching the Sacred Mountain, and the rule is so strictly observed that even chickens are banned and the monks are largely dependent for eggs on the Easter offerings of peasants from the surrounding countryside.

Formerly the monasteries were very richly endowed, but the two Wars and the Russian Revolution destroyed the sources of income of several, and the wealth of the community as a whole has been much reduced. In the old days visitors from the outside world were welcomed as guests and allowed to stay indefinitely at the different monasteries; now a time limit is imposed, but Greek gossip declares that a man might pass his life on Aigion Oros without money and with no more effort than that involved in travelling in proper rotation from one monastery to the next. The scenery of the little peninsula is unusually charming and picturesque, and some of the monasteries are beautifully situated and of great interest to the architect and historian. Pilgrims visit Aigion Oros from all over the Balkan peninsula.

Beauty and Colour of the Scenery. The beauty of the Greek countryside is as celebrated

as it is difficult to describe, but of all Greece the country around Athenai is, even apart from its associations, the most extraordinary. "Round this wide, yellow, barren plain," wrote Thackeray, describing the scene, "there rises, as it were, a sort of chorus of the most beautiful mountains—the most elegant, gracious and noble the eye ever looked upon. These hills do not appear at all lofty or terrible, but superbly rich and aristocratic." Other writers

rice growing among the newly drained marshes. One of the loveliest stretches of country is that lying between Athenai and Korinthos (Corinth) which follows the Sacred Way to Eleusis. On one side the mountains rise steeply to a height of several thousand feet, their slopes covered with pine forests and low scrub; on the other side the blue of the sea is intensified in contrast with the dark evergreen trees, and the road, constructed between mountains and sea, makes



ATHENAI

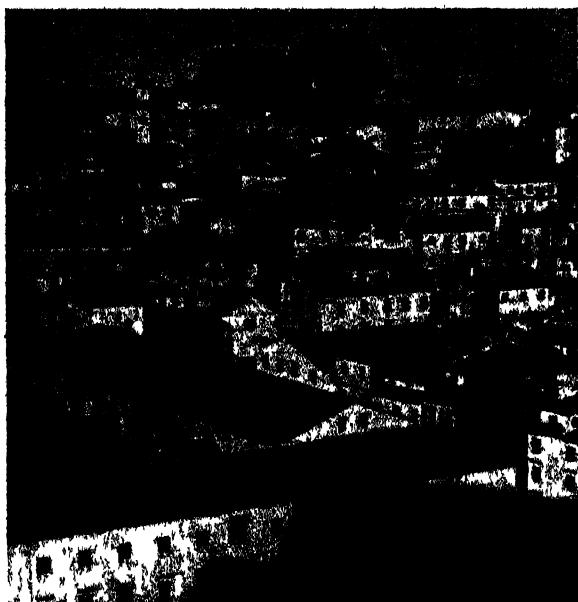
Looking towards the Acropolis and the ruins of the ancient city from terraces covered with sub-tropical flowers

have stressed the glowing colours of the landscape. The soil is often barren, but the bare earth is richly coloured, vivid red, reddish brown, and blue-ish grey, in striking contrast with the silvery olive trees that grow almost everywhere, and the luminous brightness of the skies.

The changing character of the scenery is one of its chief charms; in a short space of time it is possible to visit such widely contrasted scenes as the richly cultivated plains of Kerkyra (Corfu), one of the world's most beautiful islands; the heights of Olympus; the plain of Marathon with the sea beyond, and the inland plain of Macedonia with tobacco, cotton and

sharp zig-zags, sometimes falling almost to sea-level, sometimes rising steeply along the mountain side.

Communications. With a few outstanding exceptions Greek roads are very bad indeed. An excellent motor road leads from the Yugoslav frontier to Athenai, but the ordinary country roads are hardly more than cart-tracks. Nor is this to be wondered at: in the past the sea has been the main method of communication. There are now railways connecting the chief towns, though the network is insufficient to make travel easy in visiting the smaller places. Future development must obviously depend on the progress of industrialization



CORFU
Photo Fox

generally, for there is not yet enough traffic to make all the lines profitable even to-day. Air routes are making Athens increasingly important, and are linking it up with other European trade centres.

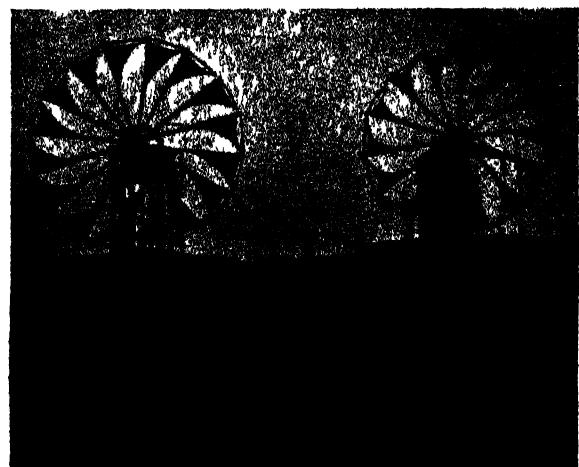
Land Tenure, Old and New. Greece is now mainly a country of small peasant proprietors. Under Turkish rule the land was held in large estates by Turkish beys and aghas, and farmed by the native Greek peasantry who were, for the most part, landless. As the Greek provinces successively won their freedom from the Ottoman Empire many estates were divided among the peasants, but in certain provinces, particularly Euvvoia, Thessalonike, Ioannina (Epiros) and Macedonia, the estates passed intact from Turkish to Greek landowners. Most of the big estates were farmed on a system by which the tenant held a certain amount of land rent free (the amount varying in proportion to the number of animals he possessed), with free living accommodation and with seed, in return for which the harvest was divided between landlord and tenant, generally in the proportion of two-thirds to the former and one-third to the latter.

This form of agrarian organization, which had long been abandoned in several western European countries, inflicted a good deal of hardship on the peasants and considerable inconvenience on the landlords. Gradually it was superseded by private agreements between

landlords and tenants for the sale of estates to the latter over a period of years. A series of agrarian laws, the first passed in 1907 and an important one in 1926, now regulates the division of large estates, fixes compensation, and has planned the settlement of Greek refugees from Turkish territory. Land is not granted in separate family holdings but to small groups and associations, in proportion to the amount of labour and livestock available to work it. These groups have, however, power to subdivide their collective holdings among the individual proprietors where communal farming proves, for whatever reason, unsatisfactory. Expropriated landlords are allowed to retain a part of their estates, varying in proportion to their original holdings, but with a fixed minimum of thirty hectares and a fixed maximum of 200 hectares. Exemptions have also been granted to cover forests, orchards, vineyards and certain special categories of land such as historic sites and the neighbourhood of thermal springs.

Greek economy was ruined by the occupation of the country by the Italians, Germans and Bulgarians from 1941 to 1944, and in 1948 the area under cultivation was considerably reduced owing to Communist guerrilla activities.

Tobacco. Tobacco is by far the most important agricultural crop, and accounts for about 45 per cent of the total value of all exports. Before the 1914-18 War it was grown to some extent in Greek Macedonia, but chiefly in Acarnia, Thessalonike, Peloponnesos and the islands of Samos and Mytilene. Its widespread cultivation in Macedonia and Thrace originated as a result of the need to find a



THE WINDMILLS OF MILO
Photo: Fox

commercially profitable crop for cultivation by the refugee population settled there after the War. To-day nearly three-quarters of the total tobacco crop is produced in Macedonia and Thrace, and Macedonian tobacco is recognized as being of outstandingly high quality.

The best tobacco land in Greece lies between Kavalla and Xanthe. The fields are spread between rocky hills, and to a stranger the crops look thin and poor. But it is here that Sun and soil combine to produce one of the finest tobaccos in the world. The highest quality leaf goes to the U.S.A., the second grade is exported to Continental Europe. Each leaf is threaded by hand, and the long strings are hung in the open air to dry. Towards the end of the winter the tobacco is transported to Xanthe or Kavalla where it is re-sorted and graded before being sold.

Cereal Production. A high proportion of the cultivated area of Greece is devoted to cereal production, but, except in Macedonia and Thrace the yield is low and the crops often of indifferent quality. Thus the yield per stremma (about one quarter of an acre) of wheat is only seventy kilograms in Greece compared with ninety-six in Bulgaria, 175 in Germany and 212 in Great Britain. The yield of other cereal crops bears a similarly unfavourable comparison with those of the Balkan States, and western European countries.

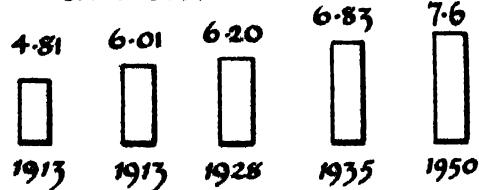
Low productivity is due as much to the primitive methods of cultivation generally employed as to the initial poverty of the soil. Chemical fertilizers and new mechanical devices were comparatively rare before the

second World War. As a recipient of Marshall Aid, however, Greece has since been able to import some much-needed agricultural machinery, and some progress towards modernization has been made. It is significant that sugar beet, commonly grown all over Europe as a rotation crop for its manurial residues, and because it obviates the necessity for fallowing, is not grown in Greece. Where the State agricultural service has replaced native wheat with seed from Egypt and Australia, the yield has increased sometimes as much as 100 per cent. The spread of agricultural education through various types of State-organized agricultural schools, a recent innovation, may substantially increase the level of productivity, but Greece is likely to remain on balance an importer of cereals, particularly since some of the islands grow none. Compared with Bulgaria, only about one-third as much wheat per head of population is grown.

Currants and Sultanas. Known in medieval England as "raisins of Corinth," and still taking their name from the region in which they were first cultivated, currants were for generations the chief export of Greece. The world monopoly of currant production has now for some years been broken by the competition of California, Australia and South America, and Greek currants take second place to Greek tobacco. Their cultivation requires a delicate combination of soil and climate which is found chiefly in the Ionian islands of Kephallenia (Cephalonia), Zakynthos and Ithake, and the adjacent mainland, places where a light dry stony soil rich in limestone combines with a

GREECE

POPULATION in millions



Occupational Distribution in percentages of total number of persons gainfully employed

Agriculture	61.1
Industry	15.1
Commerce & Transport	12.7
Other occupations	3.1

FOREIGN TRADE By Countries

In percentages of totals of thousand millions of Drachmai

Total IMPORTS	32.5	12.4	50	47.1	1950	20.0	16.7	15.1	45.2	Total EXPORTS
214.1	U.S.A.	U.K.	W.Germany	Others		W.Germany	U.S.A.	U.K.	Others	451.6



ON THE ISLAND OF RHODES
A view of the walls which encircle the medieval capital
Photo: Blue Star Line

dispersal of rainfall ideally suited to the cultivation of the currant vine.

Sultanas have been grown commercially on the mainland only since the end of the 1914-18 War, though they were introduced into Krete about ten years earlier. The bulk of the cultivation is centred around Korinthos and Argolis, and in these districts as well as in Krete, production is chiefly in the hands of refugees from the sultana growing areas of Turkey. The quality of Greek sultanas is already established as being exceptionally high; the chief importers are Great Britain, Italy and Germany.

Olives. Greece ranks third among the olive-oil producing countries of the world, and Greek official sources claim that one fifth of the total area of the country is covered with olive groves, and that the country possesses between thirty and thirty-five million trees. The standard of cultivation is low and the crop varies widely from year to year. Oil production in a good year reaches as much as 1,000,000 quintals, in a bad year it may be no more than half this figure. In spite of the large internal consumption of both olives and olive oil, large

quantities are exported. Greek oil is of relatively poor quality, largely because the primitive methods that are still being used widely in pressing the oil from the fruit leaves a high degree of acidity in the finished product. Modern methods of crushing by machinery are being introduced slowly.

Greece possesses a great variety of mineral deposits, including iron of high content, mainly exported. Greece has to import coal and oil for fuel. Industrial development in recent years has been directed chiefly to supplying the home market for articles of domestic consumption. On the other hand, progress in agricultural research and marketing may well increase the share of the world market for oil, wine and fruit as well as tobacco; and if world economic conditions should make possible an increase in her export trade—and she can continue to steer clear of the differences that led to civil war—it is possible to envisage a substantial rise in the standard of living of the people of what can never be a rich country.

The Island of Rhodes. Rhodes is the largest of a group of islands known as the

Dodecanese, in the Aegean Sea, about twelve miles off the coast of Asia Minor: it was transferred from Italy to Greece in 1947.

Rhodes figures in mythology; in fact, since history began, it has been of importance, principally on account of its strategical position between Occident and Orient and also because of its beauty, fertility, and good climate.

The island is forty-three miles long and twenty wide. Roses, syringas, figs, grapes, nectarines, apricots, oranges, etc., flourish abundantly. Cigarettes, perfumery, carpets and pottery are manufactured.

In the fifth century, Rhodes attained great prosperity, and the famous Colossus—a huge statue at the entrance to the harbour—was built by the Dorians. It was destroyed by an

earthquake, but is always quoted as one of the Seven Wonders of the ancient world.

In 1308 the Knights of St. John of Jerusalem took possession of the island, and remained there until 1522, when they were defeated by the Turks and fled to Malta. Rhodes was ceded to Italy in 1912, after the Italian-Turkish War.

The chief interest of Rhodes is the marvellously well-preserved medieval City of the Knights of St. John. These Crusaders came from many different countries, and in the Street of the Knights are the houses of the different "tongues," as they were called. The ancient buildings have been carefully restored and new ones have been erected in a style which harmonizes with the old.

Yugoslavia

YUGOSLAVIA, one of the eastern European groupings of peoples that came into being after the 1914–18 War, might still very well be known by the shorter and perhaps more illuminating name of Serbia. The Serbs are an ancient race of Slavs—originally a tribe of Cossacks of the Don district—who settled in the Balkan peninsula as long ago as the sixth century, and eventually, in the nineteenth and twentieth centuries, were chiefly instrumental in putting an end to the Turkish rule of the Balkans. Afterwards they proved the chief stumbling block to the ambition of Germany to extend her territorial influence to the waters of the Aegean. Yugoslavia was proclaimed a republic on 29th November, 1945. The peace treaty with Italy, signed in 1947, ceded to Yugoslavia the greater part of the Italian province of Venezia Giulia, the commune of Zara and the island of Pelagosa. The present boundaries of Yugoslavia are formed by Austria and Hungary on the north; a part of northern Italy and the Adriatic on the west; Albania and Greece on the south; and Romania and Bulgaria on the east.

The republic now comprises the former Serbia, a part of what is known as Macedonia, and the former kingdom of Montenegro, together with Bosnia-Hercegovina, Croatia, and Slovenia (Carniola), which were under the control of the former Austro-Hungarian

Empire before the 1914–1918 war. Now the country is divided for administrative purposes into six Federal Units, mentioned above, and the autonomous province of Vojvodina and the autonomous region of Kosovo-Metochia (within the republic of Serbia).

There are numerous mountain ranges and scattered groups of hills and valleys on the frontiers. On the western, or seaward, side are the Dinaric Alps, with some considerable mountains, including the Lovćen (5570 feet) which commands the beautiful Bay of Kotor (Cattaro); Orjen (6218 feet); and Durmitor (8146 feet). In the east of the republic offshoots of the Transylvanian Alps and the Rhodope Mountains are found; while offshoots of the Pindus Range are in the south.

One river, the Neretva (Narenta), cuts right through a mountain range and passes through what was Bosnia and Hercegovina to empty itself in the Adriatic, with which sea it affords, to some extent, means of communication. There is very fine scenery along its course on account of the depth of the mountain gorges through which it flows turbulently. The principal rivers in the north and east are the Danube, Morava, and Sava, and there are wide and fertile plains along the courses of the rivers in the Danubian drainage system.

The Yugoslavian coastline is rugged and, although fringed with many islands, is deficient

in really good harbours. Inland the country is also rugged with a lack of proportion between the area of mountainous regions and those of plains and plateaux. There is no finer or more interesting scenery in central Europe; especially is this made evident if one takes a voyage down the Danube from the capital Beograd to the famous "Iron Gates," the narrows of the river between Orsova and Turnu Severin in south-western Romania. On the journey one passes a succession of lofty and striking mountains, the lower slopes of which are afforested, and many lovely valleys.

Going from the coast inland one encounters vast stretches of virgin forests, which present a striking contrast with the semi-tropical vegetation of the coastline itself. There are few railways and few really good roads, so that to see the best of the country and grandest scenery one must ride, and, indeed, be a good horseman.

The soil of the plains near the rivers and a narrow strip along the coastline is fertile, but in the mountainous regions it is usually poor though fit for forestry and pasturage.

Climate, Crops and Minerals. The climate varies a good deal; in the west it is that of the Mediterranean type, in the east drier and with greater extremes of temperature.

Along the coastline and for some distance from it inland snow seldom falls, but in the interior and on the mountains it covers the ground for five or six months in the year. On the coast the heaviest rainfall is in winter; inland in spring and early summer. As regards vegetation, on the coast it is similar in character to that of the Mediterranean seaboard, palms, cacti, mimosas, with olive trees and many cork oaks. In the mountain valleys the vine does well, and much wine is made. The chief fruits are cherries, apples, figs, melons and pomegranates; but various kinds of plums constitute the fruit of which the greatest quantity is grown. The plums are dried and exported, and also largely used for jam and the making of a potent spirit.

The climate of Hercegovina differs from that of Bosnia owing to its geographical position, and is warmer, resembling that of Dalmatia; hot and dry in summer and cold in winter, with a wind known as the "Bora," prevailing at certain periods of the year. Bosnia, though generally speaking rather damp and mild, is in winter cold.

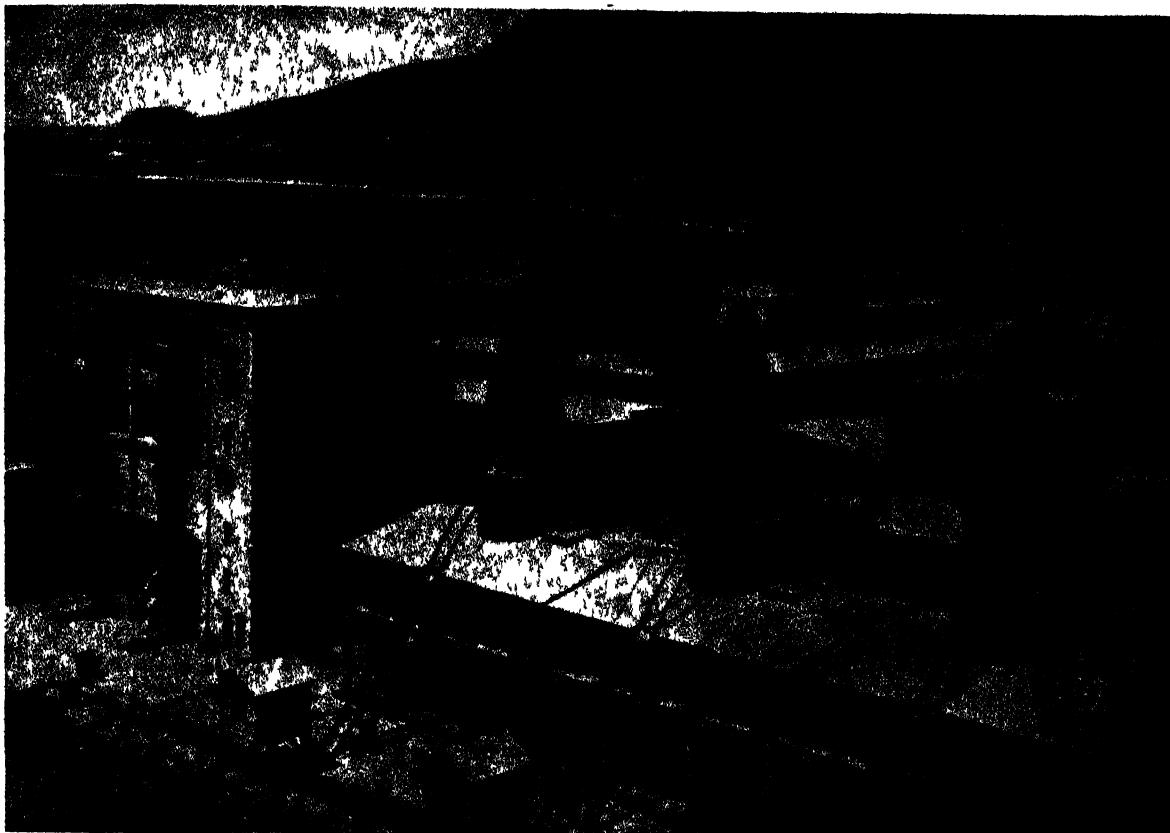
Of the cereals raised in the country maize is the chief crop (average, 3,650,000 tons per annum); wheat, oats, rye and barley are also grown. Potatoes are hardly met with, but



THE ADRIATIC COAST OF YUGOSLAVIA

Dubrovnik seen from the hills with the mountain road in the foreground showing the only means of transport possible

Photo Yugoslavia Express Agency



INDUSTRY IN YUGOSLAVIA
A carbide factory at Dugi Rat near Omis
Photo: Yugoslavia Express Agency

paprika or Turkish pepper (as in Hungary) is extensively grown, as are garlic, onions, and beans, and a few other vegetables. There is a good system of agricultural co-operation, with co-operative warehouses, credit, etc., and today there is Government control and assistance on these lines.

Mining, though more developed than before the first World War, is in its infancy, but the country possesses very rich mineral resources. Of these the most important are coal (annual production over 11,000,000 tons of brown coal or lignite), bauxite, mercury, pyrites, antimony, iron, copper, lead, silver, manganese, zinc, chrome, sulphur, salt, and some oil shale. Of recent times a more enterprising policy has been pursued as regards mining, but much more capital is required to develop fully the resources which are still awaiting exploitation.

About 75 per cent of the population of Yugoslavia is concerned with agricultural and pastoral occupations, such as afforestation, the rearing of cattle, pigs, horses, goats, sheep and

domestic poultry. There are some ancient peasant industries surviving, and in a few cases even still flourishing; these include weaving, embroidering, leather work, furniture making, and spinning. Marble, slate and stone are quarried, particularly the latter of a kind suitable for use in lithography.

Along the river valleys of Bosnia there is very fertile soil, and this is particularly the case in the less mountainous regions. In some of the valleys in recent times the sugar beet has been successfully introduced. Bosnian and Balkan tobacco, which are a Government monopoly, bring in a large revenue, and have acquired a considerable reputation; at Sarajevo and other places there are tobacco factories.

The vast forests in which there are beeches, oaks, and pines of several varieties have naturally led to the timber industry becoming one of the most important; in the valley of the Bosna, and in those of other rivers, one sees numbers of saw mills cutting wood for building purposes, and also for the production of wood pulp for paper making.

Communications and Trade. In 1939 there were about 6500 miles of railways in Yugoslavia. Since the war this total has been brought up to 7150 miles. All railways are under State ownership.

The Danube is a great commercial waterway and there are shipping facilities also on its tributaries, the Tisa and Sava. The Drina and Una can also be navigated, though only by barges and very small steamers; nevertheless they provide a valuable link with the Black Sea.

The chief customers of Yugoslavia are Britain, U.S., and Germany. The principal exports are timber, maize, and pigs. From Great Britain Yugoslavia obtains raw materials, and great quantities of cotton yarn and piece goods. Other imports from various countries are textiles, machinery and hardware. Among the most thriving industries is that of carpet weaving carried on chiefly in the old kingdom of Serbia, where pure wool carpets, dyed by a secret process handed down from father to son, are made; a special type of carpet of some reputation is manufactured at Pirot which has a population of about 14,000.

The Peoples. In Yugoslavia there are three races, the Serbs, Croats and the Slovenes, of which the first are in a great majority, and occupy a dominant position in the country.

By far the greater number of the inhabitants are peasants, and, as a consequence, one finds no hereditary nobility, and comparatively few of what is known as the middle class. Indeed, some 80 per cent are best described as small farmers who subsist on what they can get out of the land; pig and cattle breeding and correlated occupations.

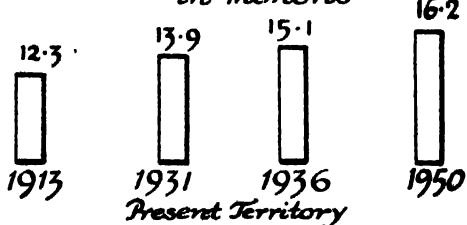
The vast majority of the inhabitants are at least nominally of the Serbian-Orthodox Church. They are eastern rather than western Christians, and in no way under the domination of Rome. Every village or other priest is looked up to as a "pope," which after all only means "father," and the priests often play a prominent part in the government and other affairs of the village.

A curious result of the heavy taxation of the peasant classes in the Middle Ages and subsequently is found to-day in the many huge, ramshackle dwellings containing numberless rooms, in which often a hundred people will be found living together. The peculiarity has arisen in this way. The taxes were levied on the headman or the house itself (as a house) so that to avoid multiple taxation it became the custom for relatives to club together and erect a house large enough to hold them all: when the younger people married they added on other accommodation, and joined the community.

YUGOSLAVIA

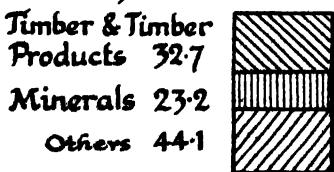
POPULATION

in millions



PRINCIPAL EXPORTS

in percentages of Total Exports in 1950



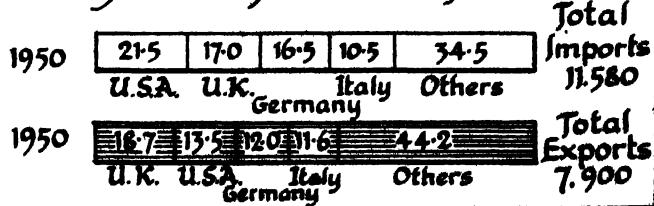
Occupational Distribution

in percentages of Total number of persons gainfully employed



FOREIGN TRADE

By countries in percentages of totals of millions of dinars



In Bosnia and Hercegovina, which are sparsely populated areas, about 30 per cent of the population still is Mohammedan. The greater proportion of the remainder is of the Greek Church, and there are also some Roman Catholics and Jews.

When examining the races one finds the Serbs, Bosnians and Hercegovinians possess a folk lore to which they cling tenaciously, and with which is bound up belief in witches, wolf-men (were-wolves), fairies, and evil and good spirits haunting the forests and rivers. These peoples, therefore, incline to the artistic temperament which has its chief expression in poetry, music and dancing rather than in literature and the fine arts.

The Croats are the better educated, as they were less influenced by the Turkish occupation of the country than were the Bosnians and Hercegovinians. They are Slavs and speak the Serbo-Croatian dialect, while they use the Latin alphabet. They are largely Roman Catholics. The standard of education in Croatia is about equal to that of most east-central European countries.

Politically the inhabitants of Yugoslavia differ considerably in outlook, as that of the Serbs is strongly Balkan, and that of the Croats far more general and European in character. It is this difference that led to friction during the years immediately following the first World War, though more recently the differences have tended to become less acute.

The maritime part of Croatia known as Dalmatia in a sense stands alone. The Roman occupation and succeeding periods of Latin influence left very definite traces upon it. Part of the littoral at one time became subject to Venice, and the Italian influence is traceable in many words of that language in the Serbo-Croatian dialect, which is generally spoken; and particularly in its art and architecture. The people are Roman Catholics.

The most Germanic province is Slovenia, which is composed of the portions of the old Austro-Hungarian Empire known as Carniola, with parts of Istria, Carinthia and Styria. In the dialect of the people one finds German words or those derived from that language occurring, but the Slovenes are Slav in sentiment.

As is the case with a number of eastern European peoples, many of the peasantry are noted for the richness, colour and beauty of



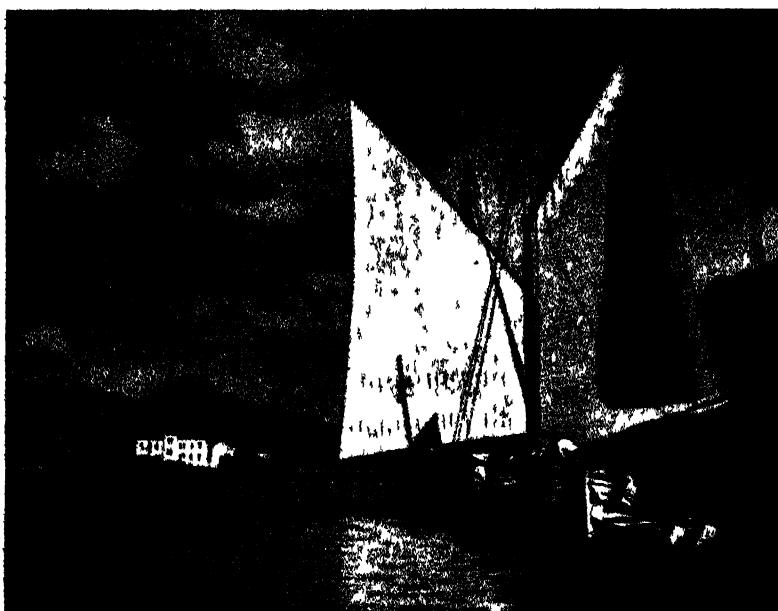
SLOVENIAN NATIONAL COSTUME

Photo: Yugoslavia Express Agency

their native costumes, which are still very generally worn. Among the most striking are those of Croatia and Bosnia.

Adriatic Ports. The Adriatic coast is amazingly picturesque and historically interesting; it is made the more enchanting by the islands, both large and small, that fringe it at various points. The three principal ports of the coast—Pola, Fiume and Trieste—belonged to Italy after 1918, but Pola and Fiume were ceded to Yugoslavia in 1947 and Trieste then became a Free City. Among the other harbours of Yugoslavia is Split (Spalato), almost in the exact centre of the coastline, sheltered by several islands including the large one of Brac. The town has a population of about 50,000 and Roman relics of great interest, including the vast ruined Palace of Diocletian; the Cathedral, with magnificent doors dating from 1214; the Museum, with interesting collections of antiquities, and the remnants of the old town walls with the Porta Aurea.

Farther south, midway between Split and Kotor (formerly Cattaro), lies Dubrovnik



THE ADRIATIC COAST
A fishing boat off the coast of Dalmatia
Photo Yugoslavia Express Agency

(formerly Ragusa), one of the most beautiful and charming towns of the littoral. Of great historic interest, it nestles on the hillside above the blue waters of the Adriatic, with its ancient buildings, old port of Gravosa, lovely gardens and medieval appearance making a delightful picture when viewed from the sea. Its beauty of situation and good climate have made it a favourite holiday resort. The old port with its stone quays, alongside which in ancient times Venetian galleys lay, has many peasant groups in gay-coloured costumes on market days. The chief objects of interest are the Cathedral; the Stradone or Corso, with its ancient buildings; the Franciscan monastery, with its beautiful garden, and church with a wonderful doorway and cloisters; and the thirteenth century Custom House.

At the far end of the beautiful and fjord-like Bocche di Cattaro, lies the third important Yugoslavian harbour, in which, indeed, two battle fleets could easily ride at anchor. Kotor, with a population of under 4000, is surrounded by towering mountains, the chief of them being the historic "Black Mountain," with its zigzag road leading up into Montenegro. The town with its steeply climbing streets lies along the waterside, and looks as though the mountain would push it into the sea. Though its population is so small it has a Cathedral, dedicated to St. Trifone, and is the seat of both Roman Catholic and Greek Orthodox Bishoprics.

Montenegrin peasants in their striking costumes come down into the town on market days. There is a trade in cheese and lace.

There are many fascinating towns in the interior. Zagreb (formerly Agram) the ancient capital of Croatia-Slavonia, with a population of 290,700, is on the left bank of the Sava in the extreme north of the country, not far from Fiume. Notable buildings include a fifteenth century Gothic Cathedral; the Palace of the Archbishop; and a University founded in 1874.

Niš, with a population of 50,500, is situated on the Nišava, a tributary of the Morava. It is an important strategic point. The old Turkish town lies on the northern

bank of the river; the more modern town on the southern bank. In the old town, as is the case in some other Yugoslavian towns once Turkish possessions, there are a number of mosques, the citadel and some interesting old houses mostly built of wood. In the modern town is the Cathedral, the Royal Palace and the Government Offices. The river is spanned by three bridges.

Ljubljana (formerly Laibach, and the capital of the Austrian province of Carniola) lies upon the canalized Ljubljanica in the shadow of an ancient fortress. It is a pleasant and modern-looking town of some 121,000 inhabitants, and has several beautiful churches as well as a fine Renaissance cathedral; a museum and picture gallery; and the residence of the former Governors. There is also a broadcasting station situated there.

One of the most interesting towns in Bosnia is Sarajevo. It is most beautifully situated at the foot of a range of hills on the River Miljacka which is spanned by handsome stone bridges and winds its way westward like a shimmering ribbon towards the Plain of Illidze. Sarajevo still preserves much of its oriental atmosphere in the bazaar and narrow streets of the Turkish part of the town, where there are old wooden houses and mosques. The town has also some fine modern buildings. A feature of the hill-sides are the deserted-looking Turkish cemeteries with the tombstones leaning all ways,

those of men with a knob-like top (representing a turban) and those of the women without this adornment. The Government buildings are handsome, especially the fine Town Hall in the Moorish style of architecture on the river front.

Mostar, in Hercegovina, with its centuries old hump-backed stone foot-bridge, which is said to date from Roman times, is charmingly situated on the Neretva. It possesses a fine Greek Cathedral and many mosques, quaint houses and a Bazaar. The population is about 23,000.

Cetinje, the old capital of Montenegro and now that of the *banovina* of Zetska, has a population of less than 6000, and is placed high up on a plateau of the Black Mountain. The former King's Palace is an unimposing building, almost like a large bungalow. The town, though small, is of considerable historic interest. Marvellous views of the surrounding country and the exquisite Bocche di Cattaro are obtained on the road up the mountain side from Kotor.

Subotica (formerly Szabadka), one of the large towns of Yugoslavia, having a population of upwards of 112,000, is an important railway junction near the Hungarian frontier, and the centre of a cereal growing area. Banjaluka in Bosnia is another large town which derives its chief importance from its position as a great road centre and the terminus of the railway from Zagreb. Its population is upwards of 32,000.

Beograd (Belgrade), though one of the smaller capitals of Europe, with a population of rather over a third of a million, is a pleasant city, which during the last decade or two has succeeded in transforming itself to a standard of some dignity and importance. Perhaps for the first time in its history it deserves the historic name of "Beograd" ("White City") given it centuries ago. Dirty and dingy under Turkish rule, it is now clean and well-kept, with modern stone and stucco buildings.

Half-encircled by the River Sava and the



BEograd

The Ministry of the President of the Council and the Treasury
Photo Planet



SPLIT
Diocletian's Palace and the Cathedral
Photo Yugoslavia Express Agenc

Danube, Beograd forms a promontory, opposite which in places is a marsh. The city stands on a narrow ridge, which juts out at the confluence of the two rivers, and it overlooks a wide plain on either hand. The ancient citadel is partly surrounded on the town side by Kalemegdan Park, laid out some years ago by Prince Michael. From the higher ground near the Citadel one obtains an unforgettable panorama of the Danube.

The progress of Beograd has, indeed, been rapid, for the Slav temperament is by nature fiery and impatient, so that great new buildings have sprung up swiftly to replace the greater

part of the old, rather drab and oriental-looking city. In a few more years almost all the remnants of the latter will have disappeared; and the ancient one- and two-storied dwellings with projecting upper floors of the Dortschol or Turkish quarter, formerly so marked a feature on the north-east of the Citadel, will have passed away.

The important Enes Mihailova (Prince Michael Street), Vidinska, Uleza, Kosmajska and other streets have now taken on an almost French style of architecture, and blocks of modern offices have supplanted architecturally much less important buildings. Of the more notable structures one may mention the Royal Palace; the Uprava Fondova, or State Mortgage Bank, the first and most important State institution of its kind in the country; the Cathedral, the lofty spire of which forms a landmark; the University; the National Museum and Library; and Government offices.

In 1947, Marshal Tito concluded treaties of "friendship, collaboration and mutual assistance" with Bulgaria, Hungary, and Romania. Since 1948, however, when Yugoslavia was expelled from the Cominform, she has turned more and more towards the west, and has accepted financial aid from Britain and the United States.



SARAJEVO
The Market
Photo: Yugoslavia Express Agenc

EAST CENTRAL EUROPE

(Czechoslovakia, Hungary, Poland and Romania)



A VILLAGE HOLIDAY

Slovak peasant girls in national costume

Photo · Clive Holland

Czechoslovakia

CZECHOSLOVAKIA came into existence on 18th October, 1918. The arrangement of the frontiers resulted in an extremely polyglot state. The census of 1930 showed that, of the 14,729,000 inhabitants, Czechs and Slovaks numbered 9,756,000; Germans 3,318,000; Magyars 719,000; Ruthenes 568,000; Poles 106,000; and Gipsies 32,000. Dissatisfaction of the minorities, particularly the German, with the treatment accorded them by the Czechoslovak Government and the determination of the German Government to include all German-speaking people under its own aegis, resulted, in October 1938, in very considerable revisions of the Czechoslovak frontiers.

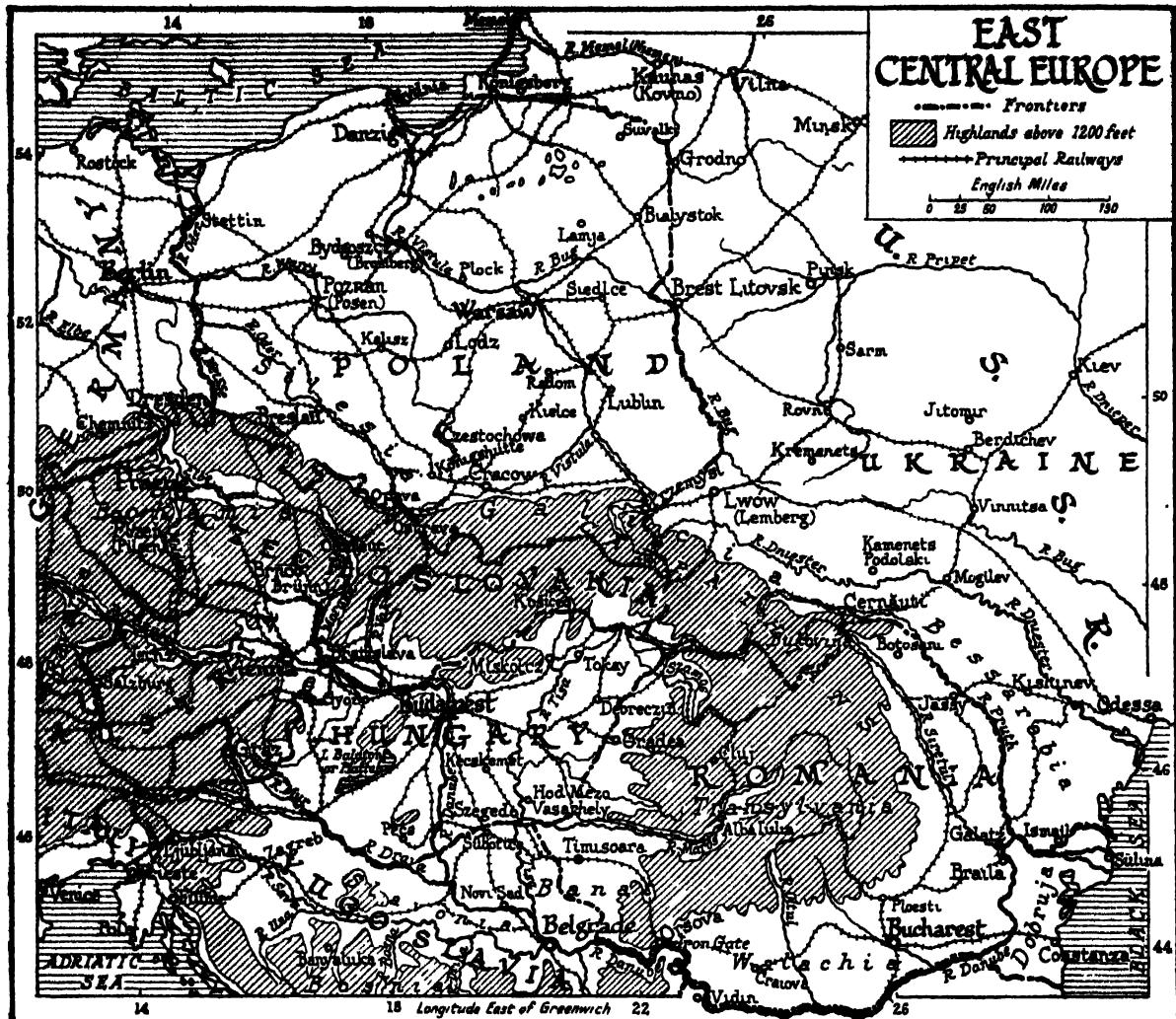
Roughly one-third of both the area and population of the State were ceded to neighbouring countries. The area of the Czecho-

slovak State set up in 1918 was about 54,600 square miles: of this in 1938 about 10,800 square miles were ceded to Germany, 4630 square miles to Hungary and 770 square miles to Poland. The area of Czechoslovakia in 1939 was estimated at 38,400 square miles.

Although engulfed by Germany during the course of the second World War, the Republic again emerged in 1945 with her old frontiers, except that she ceded Ruthenia to Russia. She regained the Sudeten areas. The area is now 49,400 square miles and the population 12,513,000.

The Czechoslovak Republic consisted of Bohemia, Moravia and Silesia, and Slovakia. In 1948 the provinces were abolished and replaced by 19 administrative units, called "regions."

Surrounding the State, beginning in the



ALTERNATIVE PLACE NAME SPELLINGS

Belgrade = Beograd; Bucharest = Bucuresti; Debrecen = Debrecen; Kosice = Kasa; Prague = Praha; Venice = Venezia; Vienna = Wien;
Vilna = Wilno; Warsaw = Warawa

On this map the frontiers of Czechoslovakia shown are those prior to the transfers of territory in 1938, illustrated on page 216

north and travelling anti-clockwise round the western boundaries, are the German provinces of Saxony and Bavaria. Next comes Austria: this brings us to the southern boundary of Czechoslovakia roughly opposite the point at which we started; continuing anti-clockwise we find Hungary on the southern frontiers and Russia and Poland on the west and north.

The Peoples. As can be gathered from the fact of the considerable transfer of population of 1938, the Czechoslovak Republic is still as to language somewhat polyglot. The chief languages spoken are Czech and Slovak (in reality a dialect of Czech) but there are several other dialects which are so widely in use as almost to be considered as languages.

The Czechs, if one includes the Moravian branch and the Slovaks, are in the main the descendants of Slavonic tribes which anciently pushed westward across Europe, driving out or mixing with the Celtic Boli, who had been settled in this region from pre-Christian times, and with their earlier German conquerors, the Marcommanni. The country occupied by these Slavonic tribes, consisting of the upper basin of the Elbe (Labe) and its tributaries, was shut off from more western areas and peoples by high mountains.

The Czechs developed into a race which may be considered the most practical and independent of the Slav peoples. They are however also romantic, artistic, good husbandmen,

and possessed of very real and deep national consciousness and a patriotic feeling which was doubtless strengthened by generations of harsh rule by Austria.

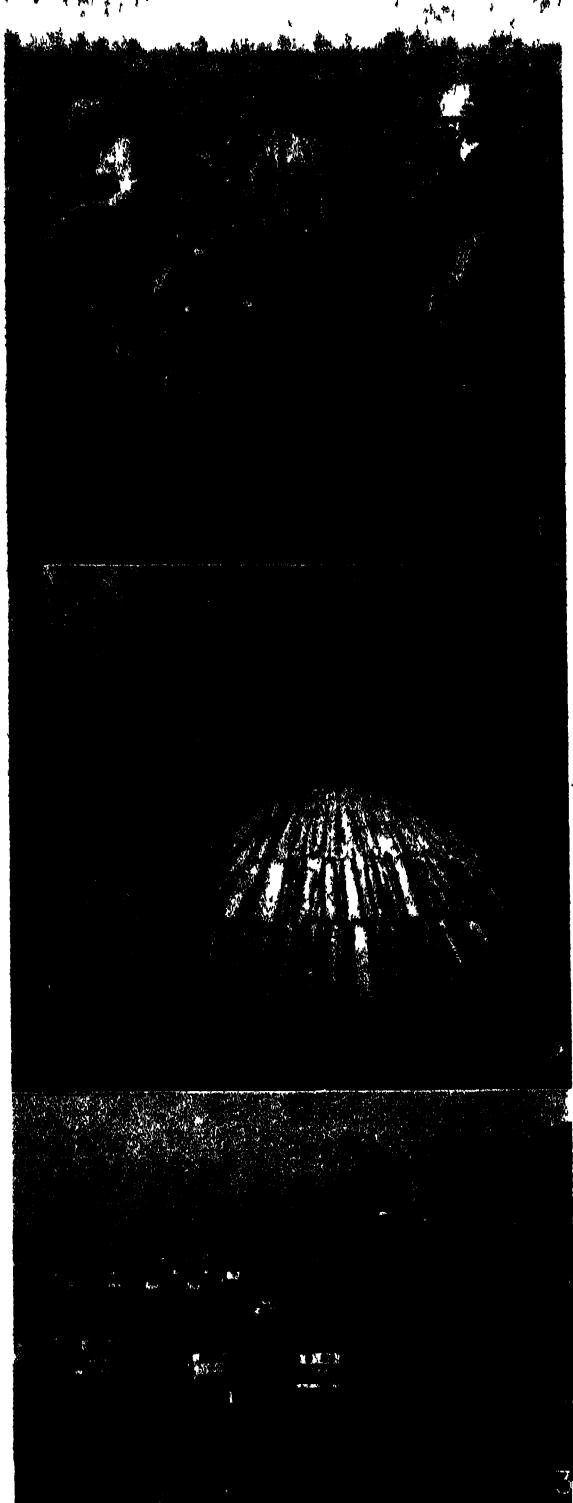
Certain qualities and characteristics distinguish the various races now termed Czechoslovakians. In Moravia, the central portion of the Republic, one finds the Horaks in the higher lands and the solid and determined Hanaks in the valleys. The former are somewhat taller than their western neighbours the Czechs, and the latter more stocky. The Czechs are more fiery, as are also the Slovaks, especially those dwelling in the foothills of the Carpathians. In colouring the Czechs are neither preponderantly fair nor dark; the Slovaks, in the main, are fair. In the north-eastern mountains dwell the Vachs, a shepherd race.

In Moravia for a long period there has been a wide-spread form of gymnastic physical culture, known as the Sokol, which has extended largely throughout the Republic. Every six years there is a great display in connection with the movement in the Stadium at Prague (Praha), where there is an average attendance daily of some 200,000 spectators. It had a great deal to do with the raising of the standard of national health and physical efficiency between the wars.

The Climate. The climate is semi-continental, with rainfall chiefly confined to the summer, when most needed. Because the country is so far from the sea, the extremes of summer and winter temperature are greater than either those of northern France or of southern England which are in about the same latitudes.

The Rivers. The country is extremely well watered. The majority of the rivers, including the Jihlava, Morava, Váh, Nitra, Hron and Ondava, flow roughly southward towards the Danube, to which main artery of transport in central Europe Czechoslovakia retains access at the important river port of Bratislava.

Variously known as Pressburg and Pozsony (the old Hungarian name), Bratislava is the old coronation town of Hungary and not unnaturally the Hungarians have considerable sentimental regard for it. The factors influencing its retention in Czechoslovakia, when the considerable revisions took place in 1938, were twofold. About one-third of the population might be regarded as Czechoslovak, one-third as Hungarian and one-third as German. There was, therefore, no ethnographic reason why the town should belong either to Czechoslovakia or to Hungary. On the other hand, Bratislava is the only port of any kind possessed by



AGRICULTURE AND TRADE

1. The tobacco harvest. 2. A clearing in the forests. 3. The harbour of Bratislava

Photos: Czechoslovak Legation; Timber Development Association

Czechoslovakia and now is that State's sole access to the Danube.

Quite apart from the facilities which they afford for the transport of merchandise, the rivers of Czechoslovakia have great importance. In their upper reaches many fall sharply and so are well suited to harnessing for the generation of electric power, which is thus produced cheaply and is a valuable adjunct to the factories of the manufacturing districts.



A MORAVIAN LANDSCAPE
Photo. Cliv Holland

In their lower courses the rivers greatly assist in watering the excellent farming country. This is particularly true of the River Váh in the valleys of Slovakia.

This great agricultural region grows immense quantities of corn and other cereals, sugar beet and much fruit, including chiefly plums, apples, cherries and melons. There are also extensive vineyards. Many of the high-roads are bordered by fruit trees, from which dangle, when the fruit still on the trees has been sold, small objects made of straw, like large shaving brushes, which denote to possible buyers that they are too late. Oxen are more used for agricultural purposes than horses.

An exception to the general run of the rivers is the Labe (Elbe) which rises on German soil in the Riesen Gebirge, flows southward into Czechoslovakia and then west and north-west to reach German soil again near Pirna. It is important as a means of communication.

Industry and Mineral Resources. In 1948 a Five-year Economic Plan of Development was enacted whereby by 1953 industrial production was to be increased by 57 per cent. Industry was largely nationalized in 1945 and

further nationalization took place in 1948. Mining operations are of very ancient date, some even extending as far back as the middle of the thirteenth century. Of recent years mining has been greatly developed, is well-organized and carried on with modern machinery. The possession of vast quantities of coal (in some districts it exists in the hills and is mined either by driving galleries, or by opening up great quarry-like pits) has enormously assisted the various industries. Lignite is also found. More than 27,500,000 tons of the latter and nearly 19,000,000 tons of hard coal were mined in 1950. Iron, found chiefly in Bohemia and Slovakia, is very important. Gold and silver are also found in the vicinity of Praha, the capital, though of the former only small quantities. Tin, copper and graphite are also mined.

In Slovakia there are important naphtha wells near Gbely, where heavy oils for lubrication are found. Lighter oils have been discovered at lower levels, and there are also, both in Slovakia and Carpatho-Ukraine (Ruthenia), considerable salt mines.

In addition to the great mineral deposits there are immense quantities of timber. Conifers of the fir and pine varieties predominate; there are also magnificent oaks, beeches and other types of trees in various parts of the country, and forestry forms one of the large industries. In many of the churches are found specimens of elaborate oak carving. A modern development resulting from the extensive timber resources has been the establishment of factories for the manufacture of paper and of cellulose.

Several important industries are closely allied with agriculture and include the manufacture of sugar, beer, malt, starch and alcohol, with preserved fruits and jam to a limited extent, and timber.

A large quantity of hops is grown, and in Bohemia—where are the world-famous Pilsen (Plzeň) municipal breweries—they can be seen on poles running thirty feet or more in height. The wine industry is an important and flourishing one, but not sufficiently large to supply all national demands.

The industries more closely connected with the towns and town life include glass making, chemicals, iron foundries, porcelain, leather, hardware, textiles, electrical goods, and engineering in various branches. There are, too, in Slovakia especially, a number of home or cottage industries, though these tend to die out.

The glass industry, including the manufacture of wonderfully beautiful and artistic beads, is an ancient one. Its centre has for centuries been in the district round Jablonica, where many of the cottagers have their own small glass-making furnaces, and whole families work together.

The territory now transferred to Russia is, generally speaking, part of the great Hungarian

territory to Russia and the lack of communications between the mountain regions and the remainder of Czechoslovakia may prove detrimental to the interests of the mountain peasants of the Carpatho-Ukraine, but it is unlikely that the mere existence of a political boundary will be enough to break down an economic relationship which has proved so mutually beneficial to the dwellers both of the



MOUNTAIN SCENERY

High Tatra, showing the scrubby vegetation of the foothills in the foreground

Photo Czechoslovak Legation

plain and is in the main farming country. The mountain peasants of the Carpathians have for centuries relied on both Ungvar (Uzhgorod) and Kassa (Košice) as market centres for their timber products. They usually journey down river to the plains at harvest time, when they sell their timber and secure work as farm labourers during the harvest, returning, in the autumn, to the mountains with the proceeds of their trading, the wages for their labours and also with grain for their winter sustenance purchased from the wheatlands of the plain. It has been suggested that the transfer of the

mountains and of the plains for so many centuries.

The most valuable Sudeten areas include the Erz Gebirge (Ore Mountains), a district particularly rich in minerals, coal and iron-ore. The territory fringing the Erz Gebirge is, in consequence of its proximity to mineral deposits, an important manufacturing centre, with iron and steel products, linen and woollen goods, leather, glass and china-ware predominating. Despite the loss of this region to Germany before the last war, Czechoslovakia still manufactured all these goods. In addition she has at Plzeň

(Pilsen) one of the most famous of European breweries as well as a special area for the production of beet-sugar. Other factors of indirect economic value are the magnificent scenery of the High Tatra Mountains in the north of Slovakia, which have become a tourist centre of note, and the mineral springs of the spas of the Váh Valley.

Some of the spas are world-famous: one may



ČESKÝ KRUMLOV
Photo Czechoslovak Legation

particularly mention Franzensbad (Františkovy Lázně) in Bohemia; the famous spas of the Váh Valley, Piešťany, and Trenčianske Teplice, with their natural hot springs, radio-active baths and radium mud. To these thousands of patients come yearly from all parts of the Continent.

Scenery and Sport. Mention has been made of the scenery of the High Tatra Mountains of which the highest peak is Gerlachovka (Gerlsdorfer Spitz), 8337 feet in height. Not only in the mountains themselves, where the scenery is exceptionally wild and magnificent, but also in many of the valleys the scenery has resemblance to that of Switzerland.

Game of all kinds is to be found in consider-

able quantities, including plentiful wild-fowl and, especially in Slovakia, enormous numbers of geese; the lakes and rivers are well stocked with fish. Even the wild boar, bear and wolf are met with in the forests of the more remote eastern parts, and stags are numerous. There is also good hunting for badgers and foxes. Speaking generally the flora and fauna are those of the higher regions of central Europe, though in the valleys many of the flowers and other botanical species met with in England are found.

There are lakes and rivers in plenty creating a beautiful countryside wherever one goes, brightened in most parts by the gaily coloured and often elaborately beautiful peasant costumes of the field workers and inhabitants, especially those worn on Sundays and festival occasions.

The Cities. The capital, Praha (Prague), will be described later: the spas have already been mentioned.

Of Bohemian cities Pilsen (Plzeň), with its 117,800 inhabitants (1947 census), great breweries, and the world famous Skoda Works, concerned with the manufacture of railway carriages, aeroplanes, automobiles, and munitions of war, ranks next after the capital. Brno, the capital of Moravia, is a town of some 273,000 inhabitants (1947 census), of much architectural and historical interest, which has from its manufactures been named the "Manchester of Czechoslovakia." It is also a great railway junction and educational and commercial centre. Loket, with its ancient castle and beautiful rivery scenery is situated picturesquely above the sharp bend of the River Ohře (Eger). The little Moravian town of Stramberk stands on the sides of a steep hill which is crowned by a lofty tower, and is much frequented by artists. The great Danube port of Bratislava (formerly Pressburg) is the capital of Slovakia. It has some 172,700 inhabitants according to the census taken in 1947, and steeply climbing streets, picturesque markets, and a ruined castle on the heights above the city; in its Cathedral the Kings of the Hapsburg Dynasty formerly were crowned. Here street notices are in three languages: Czech, Slovak and Hungarian.

Olomouc, in Moravia, has a population of 58,600, and a fifteenth century Town Hall in front of which is the amazingly ornate Trinity Column.

Kutná Hora, with about 16,000 inhabitants, is sixty miles south-east of Praha; it was made

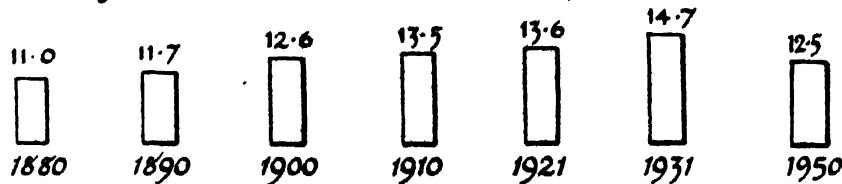


PEASANT WEDDING
Though the State of Czechoslovakia was set up only in 1918, the Czech people have been settled in Bohemia, Moravia and parts of Silesia from at least the sixth century. Among the peasants the use of traditional costumes for special occasions is still usual, as shown by the finery of the bride and groom at this country wedding.

(G 109)

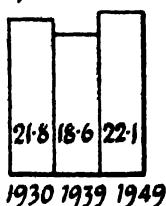
CZECHO SLOVAKIA.

Changes in POPULATION in millions



VITAL STATISTICS

Births per 1000



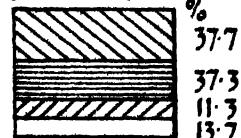
Deaths per 1000



OCCUPATIONAL DISTRIBUTION

in percentages of total number of persons gainfully employed

Agriculture.



Industry
Commerce & Transport
Other occupations

37.3
11.3
13.7

ETHNICAL DISTRIBUTION

In percentages according to Mother Tongues

Pre-war

	%
Czechs	51.15
Slovaks ...	15.76
Germans ...	22.32
Magyars ..	4.78
Ruthenians	3.79
Poles, Jews & others	2.2

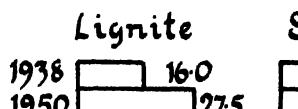
The radical changes between pre-war and post-war percentages are due to the cession of Ruthenia to the U.S.S.R. and the expulsion of over 2 million Sudeten Germans. The border areas previously occupied by the latter have been repopulated by Czechs from the interior or from abroad.

Post-war

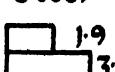
	%
Czechs	66.94
Slovaks	23.67
Germans	3.27
Magyars	3.27
Poles, Jews & Others	2.85

MINERAL PRODUCTION

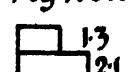
in millions of Metric Tons



Steel



Pig Iron



Goats



Cattle

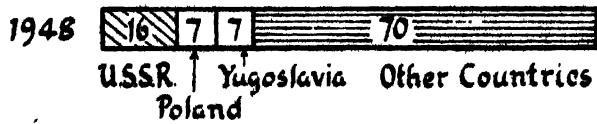
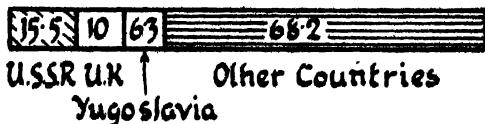


Pigs



IMPORTS & EXPORTS

Classified in percentages according to Countries of origin & destination



famous in the Middle Ages by its miners, and now possesses in its beautiful Gothic Cathedral of Ste. Barbara (with a roof shaped like the Imperial crown) one of the most lovely buildings in the Republic.

In the Valleys of the Váh, Labe, Vltava, Morava and elsewhere there are numbers of magnificent castles, many in ruins; for example those of Orava, Karlstein, Konopiště, and Trenčín; there is also the famous "Rock Town," and the Macocha Abyss, one of the greatest series of caves in the world.

Mala Strana; which has been called "the Venice of Prague."

Praha has a population of 922,284 (1947 census, as compared with 848,823 in 1930). Work for all classes of the community, even in Government Offices, commences an hour or two earlier than in London, and ceases later; but there is a break of an hour or two in the middle of the day when no business at all is done.

The Bohemians are extremely fond of music, and wonderful concerts are given. There are two opera houses, numerous cinemas, theatres,



PRAHA

*Left The Cathedral of St Vitus Right A mill and riverside houses
Photos Clive Holland, Czechoslovak Legation*

Praha (Prague). Praha, the ancient and historic capital of the Republic, is situated on both banks of the swiftly-flowing Vltava, which is spanned by numerous bridges, the magnificent Charles Bridge among them. The city owes much of its picturesqueness and charm to its situation. High above the river on the left bank rises the Hradčany Hill, crowned by the Castle; the thousand year old Cathedral of St. Vitus, in which the Bohemian kings were crowned; the chief Government offices; the town residence of the President; and a number of magnificent palaces, the homes of many of Bohemia's historic and noble families. In the shadow of the Hradčany Hill are the Houses of Parliament, foreign legations and many ancient palaces, including that built by Wallenstein in 1623. Beneath the Castle Hill also lies one of the most picturesque quarters of the city, the

and dance halls. Several of the streets and squares are notable, and the thoroughfares generally are well-kept. One may mention especially the wide and handsome, boulevard-like Vaclavské Náměstí lined with trees; which might be well-named "the Piccadilly of Praha," rising steadily till it ends at the terrace of the great Bohemian Museum, in front of which is a fine equestrian statue of Vaclav or Wenceslas, the patron Saint; the old Town Hall Square, and the Old Town Hall, in the wall of which is a wonderful astronomical clock, which chimes and has a procession of figures and a cock which crows. In the wall also is buried a finger from the battlefields on which the Czechoslovak legionaries laid down their lives. In the tower itself is a chapel where lies the "Unknown Warrior" of Czechoslovakia. Opposite the Town Hall is the famous Tyn



ONE OF CZECHOSLOVAKIA'S MODERN FACTORIES

The Batá works at Zlín

Photo: Czechoslovak Legation

Church, and in the Square is the vast monument to Jan Hus, the Reformer. Also notable is the old theatre, the Mozarteum, from the balcony of which one obtains an interesting bird's-eye view of umbrella-decked flower and fruit markets.

Other sights of Praha not to be missed are the beautiful and ancient Powder Tower with an archway through its base; the old, tree-shadowed Jewish Cemetery; the Charles Bridge with its statues and imposing end towers; and, close to the Powder Tower, the Obecni Důmr or Town House, with its famous restaurant, large concert and dancing halls, a notable centre of the social life of the city. There are in addition several interesting museums and art galleries, and Praha possesses many fine churches, and two universities. There

are in the older streets many beautiful examples of Gothic and Baroque buildings. No one should miss seeing the exquisite Belvedere.

On the river there are good services of steamers in the summer months going up and down stream, enabling the citizens to visit towns, villages and beauty spots; while the countryside in the immediate vicinity of the capital is picturesque with many pleasant wooded valleys and cherry orchards, and down stream, towards Melnik, vineyards and hills; not far distant are the slopes of the historic White Mountain.

Before the war, when travel was easier, one carried away many pleasant memories of a prosperous and singularly beautiful country, and of an industrious, enterprising and hospitable people.

Hungary

THE Paris-Budapest express pulls up at a low, oblong station-building. There is not even a village within sight, merely some half a dozen thatched roofs in the distance. It seems surprising that the fast train should stop at such a tiny place. Then the engine is detached, and steams back in the direction from which the train has come—the Austrian border. When the train moves on the engine has been replaced by an electric one. This is the first sign of

modern Hungary, steam ceding its place to electricity.

After the 1914-18 War considerable areas of former Hungarian territory were handed over to Czechoslovakia, Romania, Yugoslavia and Austria. The total area remaining to the Hungarian State was 35,935 square miles, inhabited, at the census of 1930, by 8,683,740 people, which figure had increased, according to an estimate, to 9,210,000 in 1950. In 1938 the frontiers of

Czechoslovakia were revised and an area of 4630 square miles was returned to Hungary: this area, however, was ceded to Russia by Czechoslovakia in 1945. In 1946 the National Assembly proclaimed the Hungarian Republic. A new constitution of a "republic of workers and working peasants" was adopted in August, 1949.

Bratislava, formerly Pozsony, the old coronation town of Hungary, remains in Czechoslovakia, of which State it is the only port. Its population is roughly one-third Hungarian, one-third Czechoslovak and one-third German.

The electric train speeds along the Danube shore for a good two hours. Eventually squat hills appear. Innumerable small villages are built on their slopes, each surrounded by a garden. At the foot of the hills stretches a large basin, in the evening lit at one end by powerful reflectors: this is the new airport of Budapest, one of the most up to date in Europe.

The Hungarian Capital. At night Budapest looks charming with its finest buildings flood-lit. Even one of the five bridges, the Chain Bridge—built by an English architect in the forties of last century—is studded with electric lamps. Budapest is built on both banks

of the Danube. Buda, on the western hilly bank, is the old part of the town, while Pest on the flat eastern bank, spreads on the outskirts of the plain. The traveller looking at the Buda side from the Danube quay, after sunset, or watching the city from the top of one of the hills, has the impression of being transferred to fairyland. The imposing outlines of the Citadel, the Royal Castle and the Coronation Church stand out against a dark background.

In the morning those travellers who stop at a Danube-side hotel are regaled by a wonderful sight. In summer, when the Sun is blazing, the water is really blue, and everything else seems touched by a haze of gold. Driving about in a car, however, one is soon brought back to reality by the throbbing life of the city. One realizes that Budapest is a European metropolis. In 1936 the Hungarian capital had 1,060,720 inhabitants, and in 1950 the total was roughly the same.

Budapest has fewer historic buildings than other capitals on the Continent. There is no country which has suffered so much from wars as Hungary: struggles against Tatar and Turkish invaders left little time for building palaces.



BUDAPEST

The Hungarian Parliament buildings and the Danube photographed from the air. In the foreground the Ministry of Agriculture is on the left and the Supreme Court of Hungary on the right.

Photo: Wide World



DEBRECEN

A general view of the town showing the central square and chief shopping thoroughfare

Photo: Keystone

Pest. Pest, on the left bank of the Danube, only began to make great strides of development in the second half of the nineteenth century. The Hungarian Parliament, erected in the nineties of the last century, is a notable building. It is an imposing neo-Gothic edifice, at present too large for the requirements of Hungary. Originally built to accommodate some 600 members, only 245 used to occupy it before the second World War. The Opera House in the Andrassy ut is another building that deserves attention. Both the Houses of Parliament and the Opera are decorated with frescoes by Charles Lotz which, according to experts, are the best of their kind painted during the nineteenth century.

Looking at Pest from the air one is impressed by the very modern way in which the town has been planned. The Lónyay utca, the Ullói ut, the Baross utca and the Andrassy ut radiate fan-wise from the centre. (*Ut* means avenue, *utca* street in Hungarian.) The "little circle" and the "big circle" cut across them horizontally, connecting the most distant bridges. The Andrassy ut is the broadest of all Budapest avenues; a line of plane trees shades the pavement on each side.

Buda. Walking along the narrow streets of

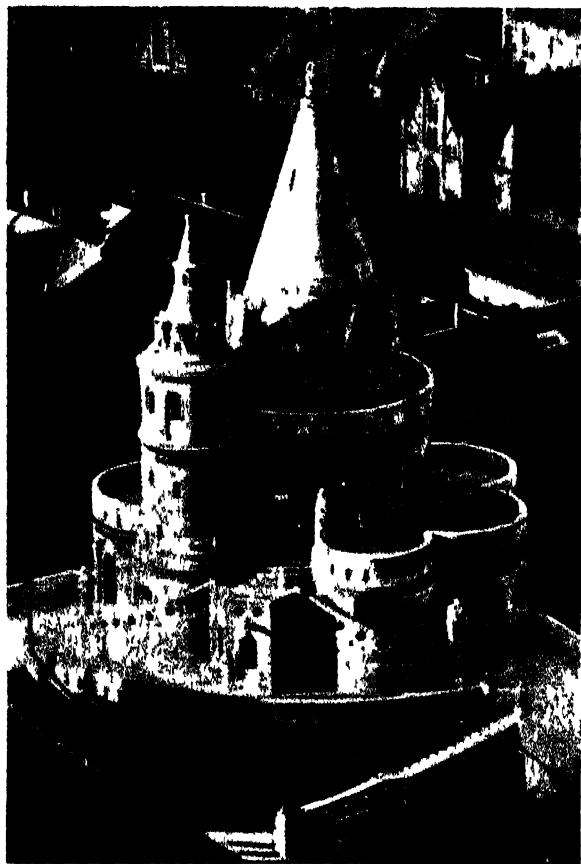
Buda, one is struck by an old-fashioned atmosphere, usually associated only with out-of-the-way provincial towns. If one peers under the heavy door-ways, one gets a glimpse of cobbled courtyards, of rambling "backs," covered by creepers, and of tidy little old women sitting in the sunshine. One cannot avoid the impression that one has caught sight of a world now gone which has found its last refuge in the sheltered houses of Buda.

On the top of the Castle Hill many family houses bear testimony to the taste and skill of old Hungarian architects. The St. Mathias Church, almost 900 years old, is Hungary's finest Gothic monument. In front of it looms the white marble Fishers Bastion, from which one gets a magnificent view of the Danube and the Pest side.

Baths and Mineral Springs. Budapest is a spa, possessing eight medicinal springs, nine hot water springs, and about two hundred springs of various mineral waters. Among the numerous baths of the Hungarian capital, the Széchenyi is one of the best known, as it is built around the hottest natural spring in Europe. The most modern is, however, the Gellért bath. In the winter the Gellért Hotel is heated entirely by the water of the thirteen

hot springs of the Gellért hill, but its greatest asset is the therapeutic mud, which has a wonderful effect on sciatica and rheumatic afflictions. In the Lukács bath, which is also situated in Buda, a special nursing home was established for rheumatic patients.

Before leaving Budapest every traveller would do well to visit the Margaret Island, thus named after the remarkable daughter of King Béla IV, who ruled in the thirteenth



BUDAPEST

The white marble structure of the Fisher's Bastion commanding the Buda side of the Danube

Photo Wide World

century. It was during his reign, in the years 1241-42, that the Tatar hordes of Genghis Khan overran Hungary. At that time Princess Margaret made a vow to retire to a convent if her father were successful in regaining his throne. She was as good as her word, and spent the rest of her life in a convent on this 160 acre island of the Danube, which is now one big park. Nursing homes, hotels, clubs, restaurants and swimming pools are dotted all over the island. There are fine tennis courts and

sports grounds and the rose garden is regarded as a special attraction.

There is a small, but very select, collection of pictures at the Museum of Fine Arts; the china, potteries and carpets of the Museum of Applied Arts are well worth seeing, and the Migration Period Finds, housed in the National Museum, are unique.

The Great Plain. In pre-historic times the Great Hungarian Plain (the Alföld), on the edges of which Budapest lies, was a sea-bottom. It is for this reason that the geographical formation of Hungary's central part is a very curious one. To this day the Hungarians do not quite know what treasures the soil of the great wheat-bearing plain may yet reveal. Near Hajdu-Szoboszló, on the fringes of the Hortobágy, an amazing hot spring shoots up into the air from a depth of approximately 7000 feet. This water acts as a quick cure on stomach complaints, besides its beneficial effects for rheumatism and catarrh. Close by there is also a gas emanation, which can be used for lighting purposes, but so far has not been fully exploited.

Since 1932 efforts have been made to drill for oil. Oil production has risen from about 40,000 tons in 1938 to 500,000 tons in 1950.

Debrecen. Debrecen is one of the most interesting provincial towns. It can be reached from Budapest in two hours on a Diesel-electric "rail bus," which runs at an average speed of 53 m.p.h. Debrecen is known as "Calvinist Rome," having been for 400 years the centre of Hungarian Protestantism. Though only having 126,000 inhabitants, it is the third largest provincial city. It has a very up to date university. It once possessed a boys' college at which all subjects were taught in English. In the summer the population is about half what it is during the winter. The explanation is that the people are chiefly small landowners, who spend the summer months working on their farms.

Landholdings and Agriculture. In Hungary before the war about half of the arable land was owned by small holders; the rest was divided between medium-sized and big estates. The largest landowner in 1939 was Prince Esterházy, who possessed roughly 200,000 acres. It was one of his ancestors who had a bet with an English duke that he had more sheepdogs than the duke had sheep. Esterházy won the bet.

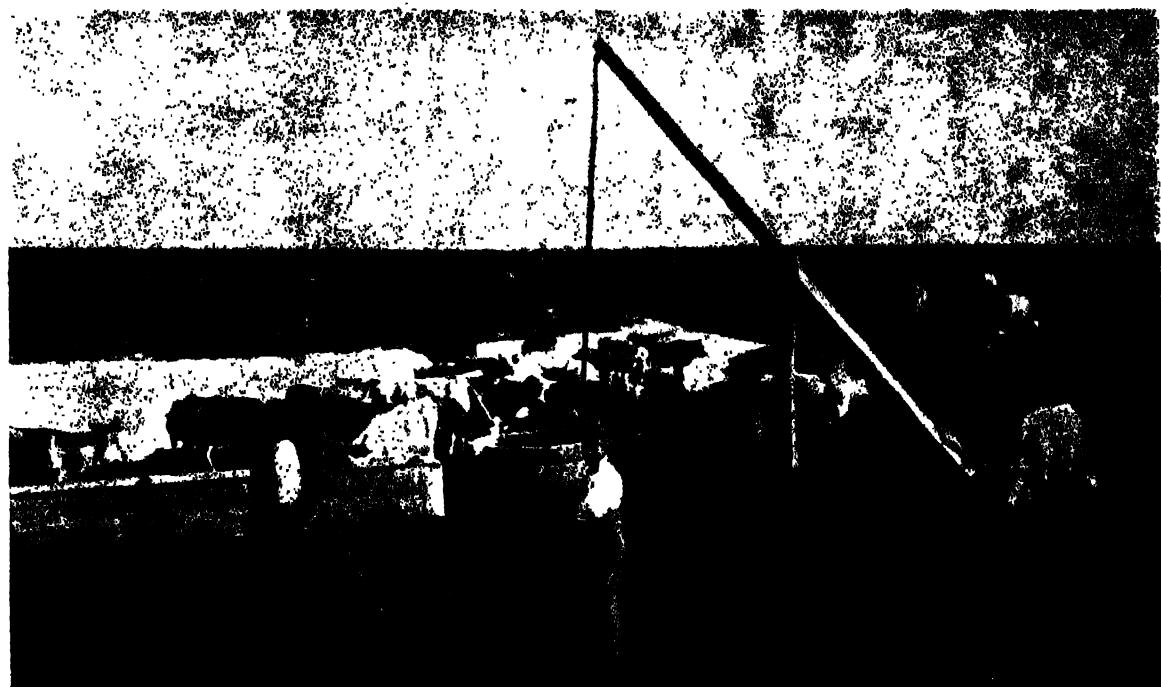
Since the war it has been the policy of the Hungarian Government to increase the number and to strengthen the position of the small

landowners, both by preferential taxation and land settlements. So far 7,962,695 acres have been distributed—58·2 per cent (arable land) among individual holders and 41·8 per cent (forest) for public purposes.

The main products of Hungarian agriculture are cereals in general, and wheat in particular. To find a market for the Hungarian cereal surpluses is every year the central problem of the administration. Within recent years it has

emerge tall buildings, perhaps the spire of a church amidst them. But as one seeks to approach this welcome vision, and dreams of cooling one's limbs in the sea, it vanishes into thin air, leaving once again a vista of miles and miles of arid pasture. The Sahara and the Gobi deserts are the only other places in the world where this phenomenon can be observed frequently.

The cattle, the horses and the sheep of the



PRAIRIE OF HUNGARY
A herdsman with his cattle at a pool near Herkovend
Photo: Keystone

become more and more obvious that an outlet had to be found for Hungarian horses, cattle and pigs. Especially during the great depression between 1929–31 it was realized that the farmer, big or small, could only assure himself a relatively steady income if he could count on selling his animals as well as his cereals. The search for a permanent market for both cereals and stocks has always been, and is bound always to remain, a key problem.

On the outskirts of Debrecen is the *Hortobágy*, the famous Hungarian pasture land, where lucky people can see the Fata Morgana. When driving across this seemingly endless plain, on a hot summer day, the Sun literally scorching man, animal and plant, suddenly the eyes may observe a wavy sea. Out of the waves will

Debrecen small holders are turned out to graze on the *Hortobágy* in the spring, and they stay out until the winter. It is a remarkable example of the communal herd system in that part of Europe, which is a relic of old nomadic times. The herdsmen in their big sheepskin cloaks have an outlook on life and a method of dealing with their animals which, according to the best historians, date back to the ninth century when the Hungarians first appeared in Europe.

Szeged. Another important university city is Szeged. The town has a most attractive central square, on which lovely open-air performances are held every summer. Critics maintain that these are as good as the world-famous Salzburger Festspiele.

Most of the people of Szeged earn their

livelihood by growing fruit. Tons are exported every year. For the future great plans are being discussed to set up factories for the bottling of fruit juices on the spot.

Pécs. A third university centre is Pécs, situated in the south-west. It is famous for its cathedral and its catacombs. The church was built in the eleventh century. It was restored with expert knowledge at the end of last century, and Charles Lotz covered the walls with beautiful frescoes. Another interesting sight of Pécs is the Town Church, which was originally a Turkish mosque, and to this day its minaret is obviously unlike a Christian tower. The coal mines near Pécs are the most important left to Hungary.

Industry. Hungary is usually regarded as a typical agricultural country. This was formerly the case, but there was considerable change after the first World War. At the present time only 47·1 per cent of the Hungarian population earn their living from the land. After 1919 the Hungarians found that they could not sell their agricultural surpluses, thus becoming unable to pay for the raw materials and the industrial articles which they needed. So they made great efforts to develop old industries, such as machine and electrical construction, and launch new ones, such as the manufacture of textiles, rayon goods and wireless apparatus.

One of the chief difficulties was that main resources of iron, timber, coal and other raw materials had been lost. As Hungary is mainly flat land, water power from which electricity could be generated was not available. In spite

of this Hungarian industry has developed very satisfactorily. The mining of bauxite also has showed increase. Rails and parts of railway engines stand at the top of Hungarian machine exports. Their chief market used to be India.

Electric railway engines, which were invented by a Hungarian engineer, are one of the main products of the electrical industry. They find a ready market the world over. Electric lamps are also exported in quantity. The wireless industry is fairly prosperous. Not only does it provide for the home market, but complete wireless sets, as well as component parts, are sold abroad. Sweden, Norway and Yugoslavia are the best customers.

Among the new industries textiles have proved the greatest success. The most popular products abroad are printed cotton materials. They are pretty besides being inexpensive. Experiments were made with good results to produce an artificial cotton yarn. As a result cotton imports were largely reduced. Recently attempts were made to grow cotton in Hungary. Hemp and flax are also grown.

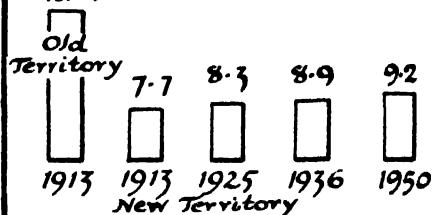
The Hungarian silk and rayon industry was another that developed beyond all expectations, and by the beginning of the war it had reached a high level of exports. The greatest efforts have been made in the production of articles of women's clothing. These used to compete in such difficult markets as London and New York. The Bemberg stockings, well known in both centres, are also in great demand all over the Balkans.

In July, 1946, the Hungarian Government

HUNGARY

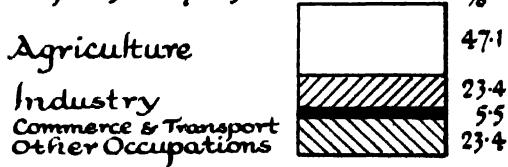
POPULATION

21.4 in millions



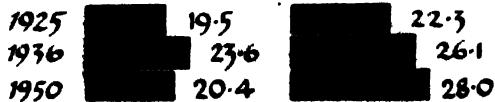
Occupational Distribution

In percentages of total number of persons gainfully employed



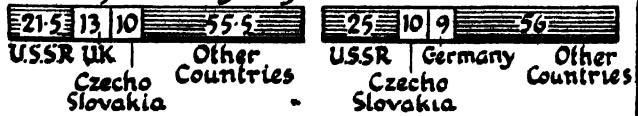
PRODUCTION in millions of quintals

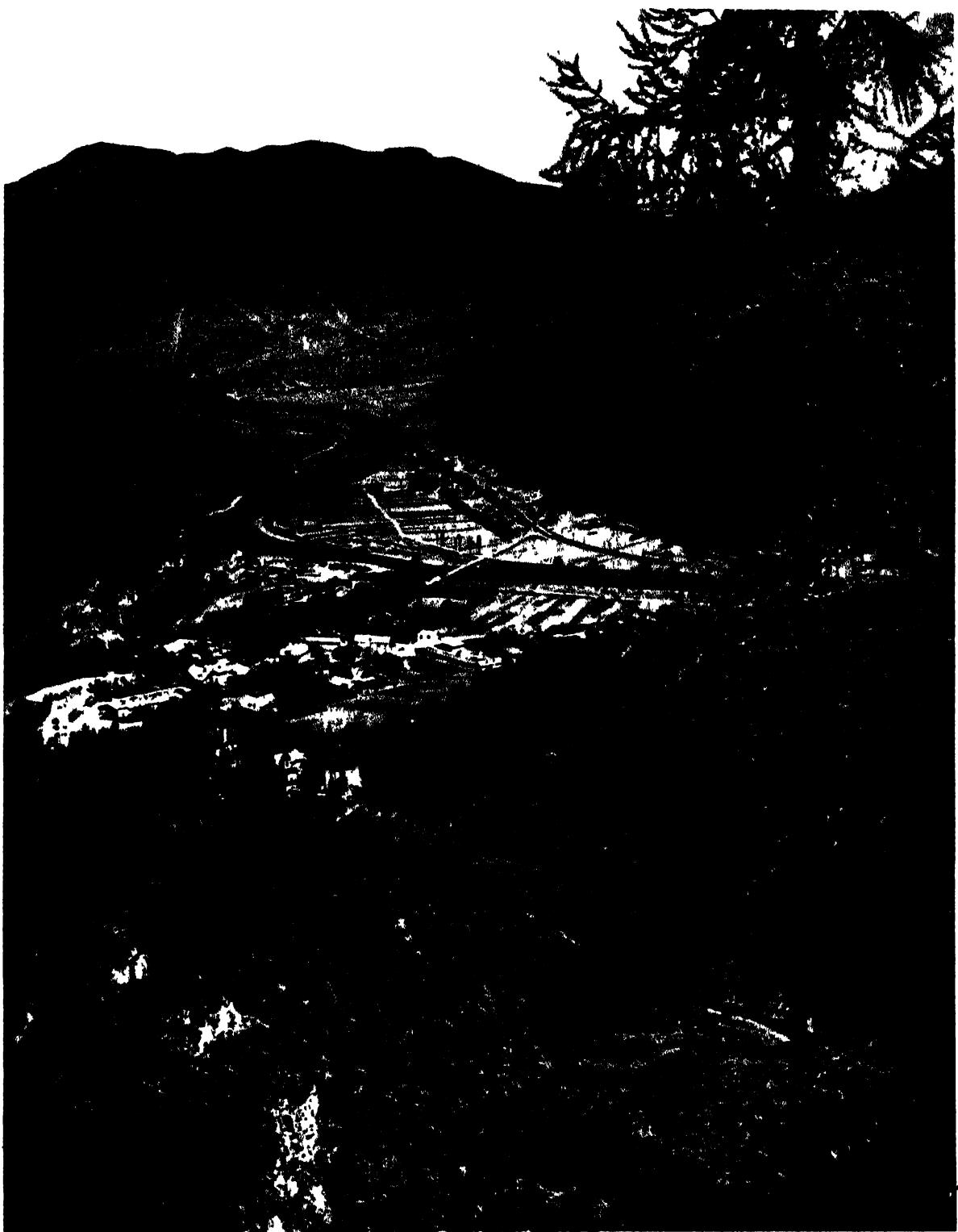
WHEAT MAIZE



IMPORTS & EXPORTS

In percentages of totals in 1949





SPA LUBOCHNA, CZECHOSLOVAKIA

Situated in Slovakia about five miles north-west of Kremnica

Photo: Czechoslovak Legation



RURAL INDUSTRY

Gathering the reeds from the frozen lake at Balaton
Photo Keystone

instituted a new monetary unit, the "forint," sub-divided into 100 "fillers." One forint equalled 400 quadrillion (400 plus 27 noughts) paper "pengo."

Scenery and Sport. From Pécs it is a lovely drive along the winding road of the Mecsek hills towards Lake Balaton. In the great woods of the Mecsek, across which the motor road cuts, many deer are to be seen and also wild boars. The trophies of Hungarian game are coveted by all sportsmen, as they are—with the possible exception of game shot

in Poland and Transylvania—the finest in Europe.

At about fifty miles from Pécs lies another attractive Hungarian provincial town, Kaposvár. It has no old part at all, for which the Turkish invaders are responsible; but its new houses are spick and span, and the town gardener has worked miracles in the way of planting flower borders all along its main streets. The tennis and football grounds are laid out in excellent taste, and are surrounded by a town park.

In another two hours' time the traveller reaches Balaton, one of the largest lakes in Europe. The view from its southern shore is magnificent; a string of volcanic hills, some cone shaped, others like minute table lands, frame the dark blue waters of the lake on the northern side. It is small wonder that innumerable legends, poems and novels have been written about Balaton. The August sporting week held here, particularly at its regattas, provides an occasion of great merrymaking.

From Balaton motorists can leave Hungary by driving straight to Graz in Austria on a first class autostrade. On this road at last they can speed along without being in danger of running over geese or chickens, or being smothered in sand or dust. Those who travel by rail or air have to go to Budapest, where they can catch one of the trans-European services.

The Hungarians are a proud and gallant people, who migrated to Europe from the vast plains of Asia, and conquered Hungary more than 1000 years ago. They have retained many of their ancient characteristic traits, in spite of having adopted Christianity in A.D. 1001, thanks to the wise decision of their first King, St. Stephen; and in spite of the fact that they were surrounded by alien races on all sides.

Poland

POLAND is not nearly so well known as it ought to be. Even its geographical position is frequently misunderstood—there is always a tendency to give an undue orientation to Poland. It is important to insist at once that Warszawa (Warsaw) is a central European capital, and does not belong to the east. Take a map of Europe and draw a series of lines

from one extreme to another—from Gibraltar to the easternmost point of the Urals, from North Cape to Cape Matapan, from the Shetland Islands to the Crimea, from Archangel to the toe of Italy, from Land's End to Astrakhan—you may be surprised to find that they all intersect near Warszawa.

The importance of Poland is so obvious that

it is surprising to find that it is often classed as of minor interest. Geographically it is one of the most important states in Europe. Ethnologically its position is vital, since it joins—or separates—the contrasted cultures of Germany and Russia, although she made a bodily shift westwards after 1945. She should be of interest to western Europeans if only because the Polish Question started the 1939–45 War and has been argued ever since.

A Vast Agricultural Plain. In the main, Poland is a vast plain, connecting the German agricultural country with the Russian steppes. Except for low hills in the Danzig area, you must make a day's journey south before you are clear of the monotonous plain.

In the south, however, the Polish-Czechoslovak frontier follows approximately the watershed of the Carpathian range. This culminates in the Tatra mountains, about sixty miles south-east of Przemysl, a range of Alpine

standard and of rare beauty. The remainder of the Carpathian chain is pleasant rather than magnificent, but green foothills extend as far as a hundred miles to the north, eventually forming an undulating table-land which gradually merges with the Polish plain.

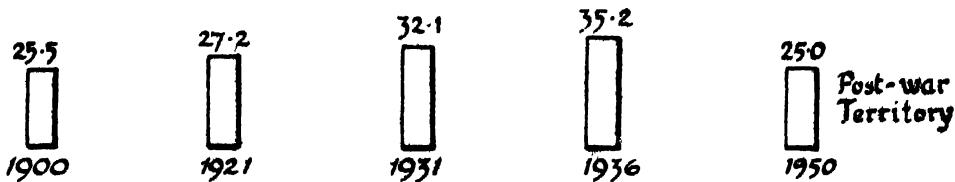
Thus, except in the south, there are no natural frontiers. In the west the Polish and German civilizations have merged, and except for political formalities and language difficulties you might step over the frontier without knowing it. In the east this is still easier, so the frontier is an artificial and arbitrary line which does not pretend to separate Poles from Russians.

The People. The Poles are, of course, a branch of the great Slav race, akin to Russians, Ukrainians, Serbs, Bulgars, Czechs, and Slovaks. It is quite impossible, however, to enumerate a list of national attributes, as could be done easily in some of the other cases



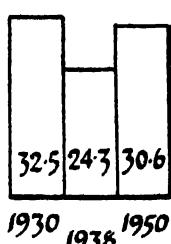
POLAND

Changes in POPULATION in millions

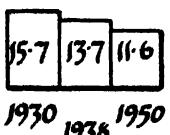


VITAL STATISTICS

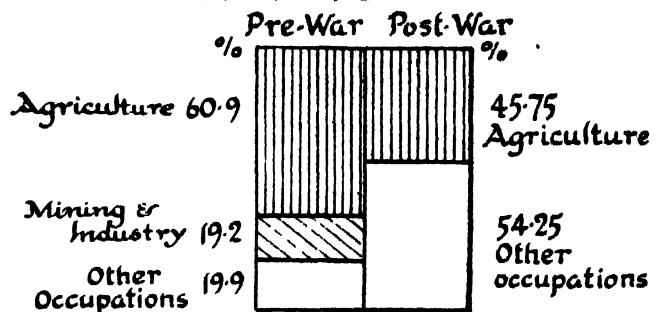
Births per 1000



Deaths per 1000



OCCUPATIONAL DISTRIBUTION



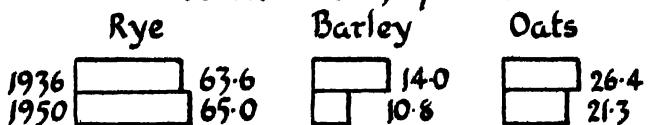
COAL PRODUCTION

in millions of tons



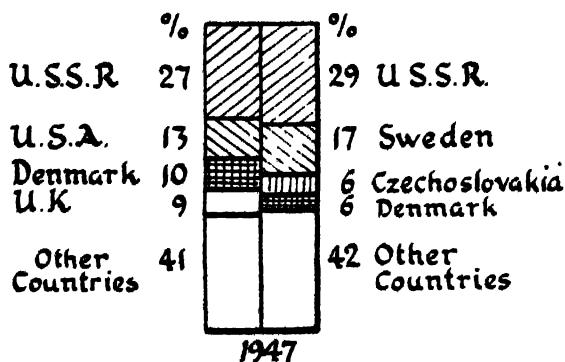
AGRICULTURAL PRODUCTION

in millions of quintals



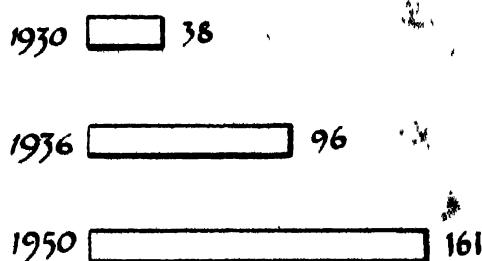
IMPORTS & EXPORTS CLASSIFIED

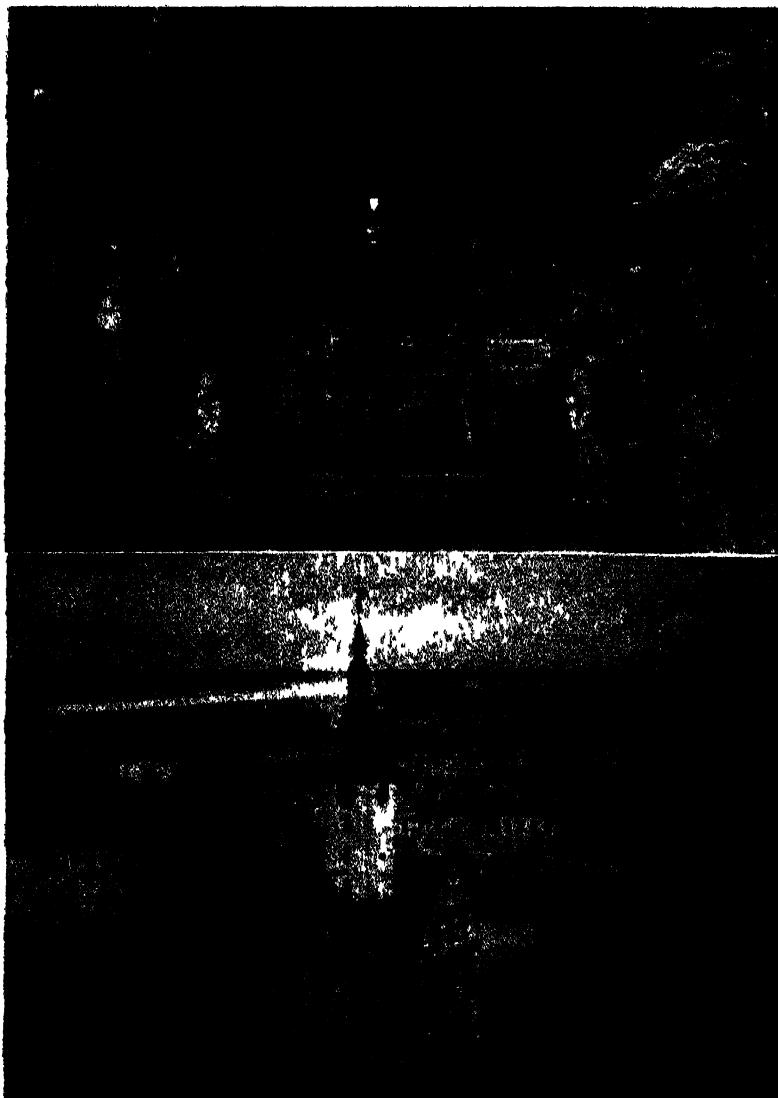
in percentages according to countries of origin & destination.



The Development of MERCANTILE MARINE

in thousands of gross reg. tons





Above: THE WIELICZKA MINES
St. Anthony's Chapel, carved entirely from salt

Below: CHELMNO
View of the Town Hall and market square
Photos *Orbis Polish Travel Office, Keystone*

The reason for this must be found in Polish history.

For many centuries Poland was a great empire, much greater in extent than at present. After its days of glory, however, there followed periods of internecine warfare. During the eighteenth century Poland became so weak that the "Partitions of Poland" began, and by the end of that century Poland as such had disappeared from the map of Europe. Russia secured the biggest share of the booty—the entire eastern section, including Warszawa. To Prussia went Poznań (Posen) and the notorious "Corridor"

area, while Austria seized the south-western corner, including the ancient capital, Cracow (Kraków).

Thus the new Poland set up in 1918 comprised people who had been brought up under three very different codes of conduct and law. Even to-day, faint traces of these three codes of law still survive—they are being amalgamated only gradually.

It was inevitable that Poland should exhibit some rather startling contrasts. The old German Poland was very well equipped with schools, for example, whereas in eastern Poland only 25 per cent of the adult population could read or write. Economically the contrasts were even more striking, for one-half of the purely industrial activity was to be found in comparatively small areas in the extreme west.

It used to be contended that Poland was on the way to becoming a great European power. Had there been no war in 1939 that might have been possible. Poland, however, felt the full force of German brutality. Her country was battered and her people "eliminated." In 1938 her population was 34,849,000; in 1946 the population of the new territory was 23,930,000. She gained after the defeat of Germany rich lands in Silesia, but forfeited a large area in the

east. There also developed internal political strife which kept a large number of skilled citizens away from her farms and factories, and the country came under the influence of Soviet Russia.

Minorities. In spite of their diverse history, the Poles themselves are a culturally united people; the Polish language is amazingly uniform for so large a country, and even the range of dialects is surprisingly small. The problem of minorities in Poland has, however, been such a serious one that it was responsible for the hostility of other countries. In 1939

10 per cent of the population was Jewish, there were 3,000,000 Ukrainians in Galicia and 2,000,000 Russians in the east. In the west there were 1,000,000 Germans. This is sufficient to explain the sundry aggressions and annexations that have marked recent Polish history while Poland herself claims interests in eastern Germany.

Resources and Manufactures. Before the war Poland was mainly agricultural; she is now as much industrial as agricultural. Silesia has a very important coal-field, the third in Europe in its production. Adjoining are valuable metal mines, zinc and iron predominating. Because of the nervousness of the times in 1939 the actual factories for the working of metals were being removed from Silesia, because of its proximity to the vulnerable German frontier and their new sites were to be found in the Przemysl-Lwów area.

Lódź, the "Manchester of Poland," is the centre of a very important textile industry, cotton, wool, flax and jute being extensively and skilfully worked. There are oil wells in the extreme central south, and the usual semi-domestic factories for wares like glass, chemicals, paper, and so on.

The key industries have now been nationalized or are under State control and in all branches of industry planned economy has been introduced.

For its external trade, however, Poland depends very largely on agricultural products—except for considerable exports of coal. The timber industry is important and the production of sugar even more flourishing. Corn, bacon and eggs of excellent quality are exported in large quantities. The agricultural production is amazing when it is considered that practically all of it comes from peasant farms. Only 19,000 holdings exceed the moderate area of 250 acres, while 3,200,000 holdings are less than fifty acres and of these 1,110,000 are less than five acres. The most



Gdynia

Above The port, the busiest on the Baltic
Below Timber for paper manufacture ready for export

Photo Orbis Polish Travel Office

fertile regions are those of the west, the district of Poznań and Pomorze being famous granaries even in medieval days. Towards the eastern frontiers natural advantages are not so great and cultivation is less intense.

Life of the Peasant Farmer. The most important person in Poland is the peasant farmer. His conditions of life vary little over the whole country, except that in the west the peasant employs more modern methods and has better roads to transport his produce. He

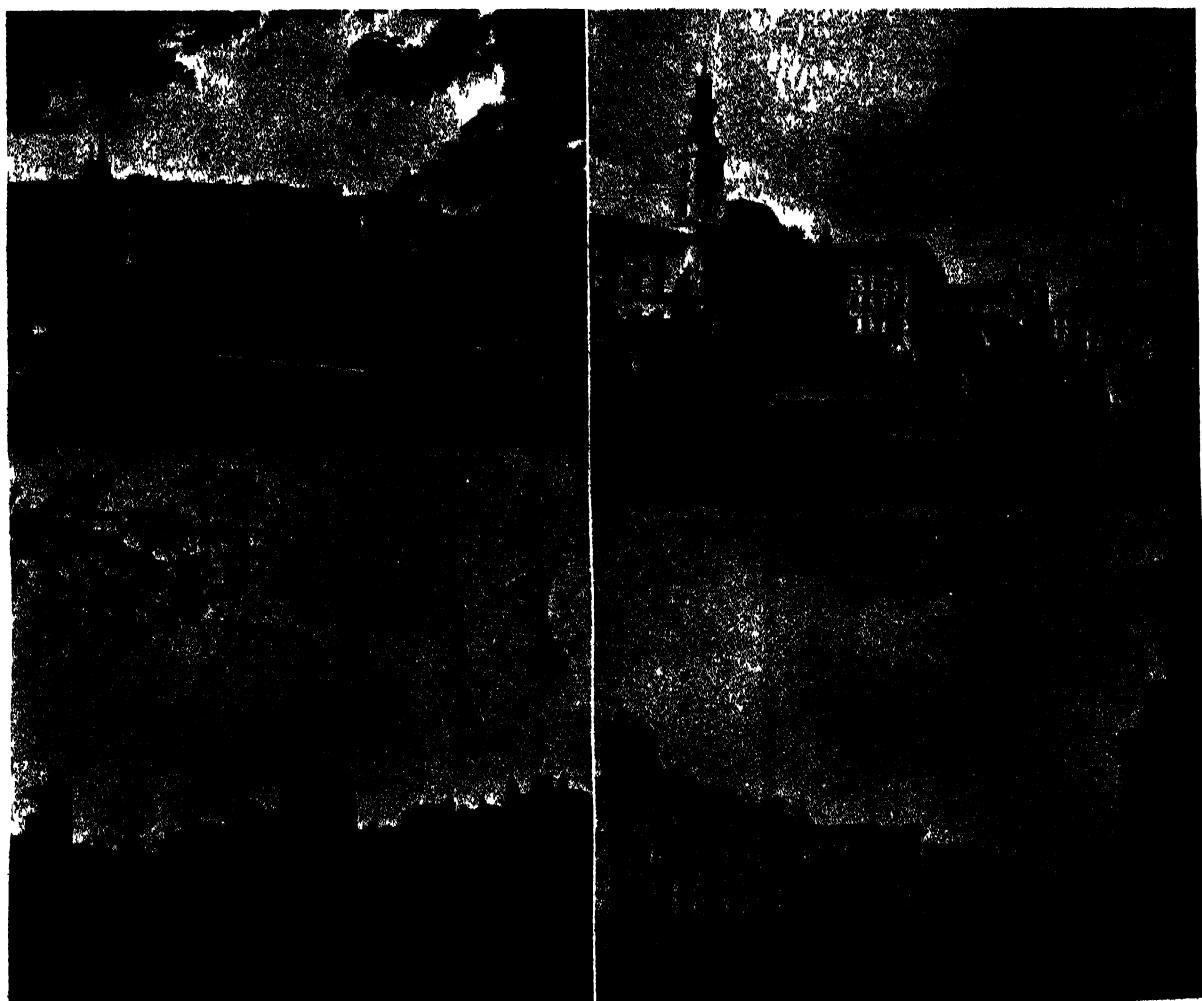
lives, almost without exception, in a one-storey wooden house, with thatched or shingled roof, and one or at most two rooms. A village will consist of fifty or a hundred such cottages, and before the war each had a Jew as its trader and money-lender.

It is a monotonous life. In every direction is the eternal flatness of the plain, relieved only by the narrow strips of the peasant holdings and an occasional line of trees. Except in the long hours of darkness in winter, there is always work to be done by the whole family. Amusements, as we know them, do not exist. Sometimes there is a fête, or a wedding. Marriages are seldom celebrated during the summer, when every hour is precious and every hand needed.

The peasant boy belongs to the soil. He may

not even achieve the dignity of being born under a roof, for his mother continues her work until the very last moment, and births in the fields are quite common. A few days later, in any case, she will take up her work where she left it, and will sling her baby in a rough hammock under a tree. As soon as he can walk he is given charge of the family geese: at five he directs the grazing of the family cow. Double his years, with interludes for school, and he is classed as a man—he takes his place in the family gang. He lives with the soil, surrounded by people of the soil. The only external influence comes, surprisingly enough, from his compulsory military service, which probably gives him his first glimpse of city life.

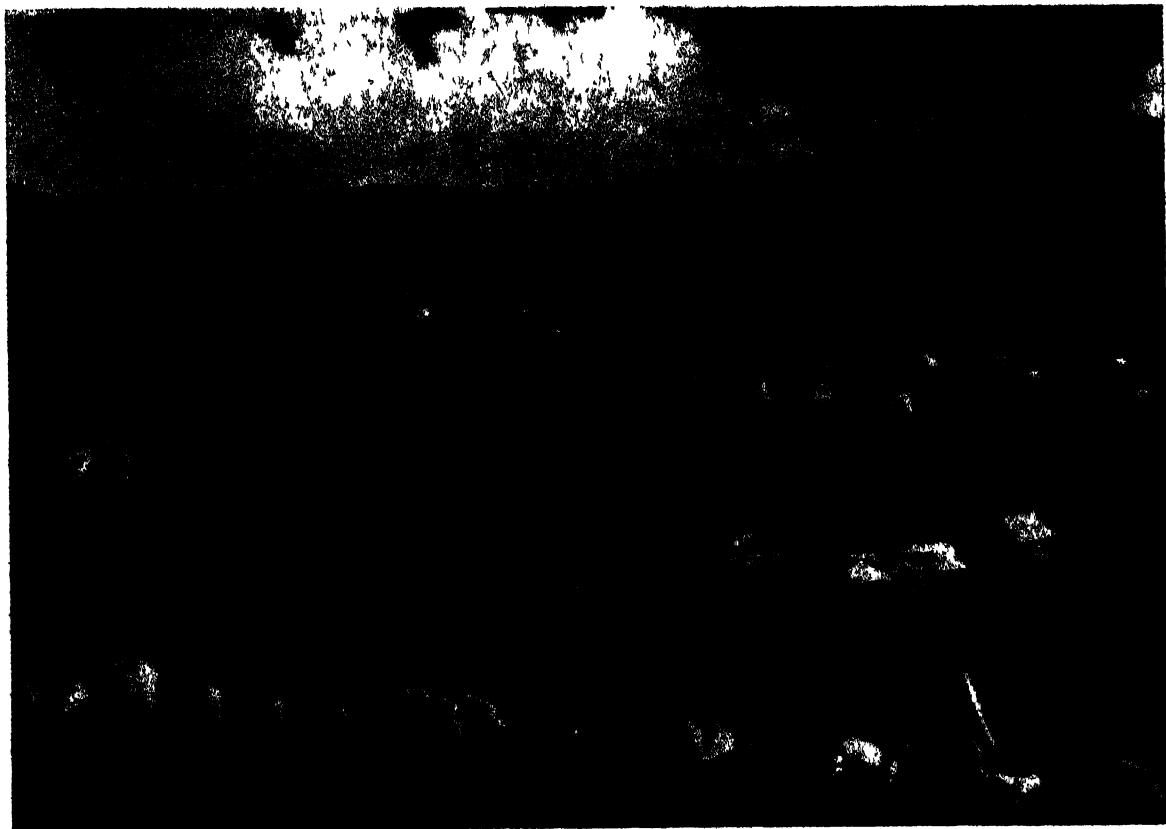
He will never be rich, whether he owns his



THE TRAGEDY OF WARSZAWA

Two views of the city before and after the bombing of the second World War. Left: The Royal Palace, now reduced to a mass of rubble. Right: The Town Hall and Opera House, once the pride of the Polish Capital.

Photos Keystone



THE RURAL LANDSCAPE

A shepherd grazing his flock on the low hills overlooking the Wilia (Vistula) Valley
Photo. *Orbis Polish Travel Office*

own strip of land or works for a relative. He is at the mercy of the seasons, and of world prices. He does not starve, but in bad times he cannot afford to buy manufactured products. There are villages where every article, including clothes, is home-made. The small size of his holding is a great handicap and modern machinery is often too expensive for such tiny strips.

Co-operative farming, however, which was in its infancy before the war, is growing apace (it doubled during 1952). It is claimed that the yields are 25 per cent higher than on individual peasant holdings.

Communications. Transport is a vital consideration in an agricultural country. In the western third of Poland both roads and railways are reasonably good and adequate. In the territory nearer Russia, however, they are scanty and of very poor quality. For this reason the production of Poland is only a fraction of what it could be—a farmer is not likely to exert himself to additional production if it is only at prohibitive cost that he can get his goods to market. The problems of commun-

ication are by no means neglected by the Government, but it is hampered by peasant conservatism. Roads and railways cost money, but peasants hate paying taxes.

There are altogether some 60,000 miles of good surfaced roads, and the planning authorities have announced that they aim to increase this materially. The number of motor vehicles using the roads has trebled since the period before the war, when the most common vehicle to be seen in the eastern part was the long wooden cart, drawn by one or two shaggy ponies.

The railway difficulty, of course, is aggravated by the fact that Poland took over fractions of three systems independently planned. The railways of the south-west corner radiated from Berlin, as did those of the Silesian minefield. To-day Silesian coal for export has to be carried to Danzig or Gdynia, and it was necessary to construct new lines to meet the new conditions. Owing to the lack of industrial enterprise in the east, great areas had for a long time to be satisfied with the totally inadequate communications of pre-1914 Russia.

Warszawa and Cracow. Warszawa, the capital of Poland, was utterly destroyed during the battle for the city in 1944: only 20 per cent of the pre-war city remained standing. There used to be fine streets with shops which would not disgrace any capital of Europe; stately public buildings and an ancient palace; a cathedral and churches of distinction; green parks, and noble monuments—one might easily imagine oneself in Berlin. Far more intriguing, however, was the Stare Miasto,

trated. Dirty, insanitary, over-crowded, their environment was very unpleasant. The Jews formed a real problem in Poland. There were over three million of them in 1939—10 per cent of the population. They did not become assimilated, but remained a tribe apart. One could see them in any Polish town in their black coats and round hats with tiny peaks. All the men were whiskered and the boys wore the distinctive curls of their race. They held fiercely to their religion, and their only intercourse with Christians was that of business.

The number of Jews in Poland was so high because of the Russian policy of segregating them in the Pale—the outlying ring of provinces about Russia proper, of which Poland was the chief. For generations they controlled the commerce of Poland and there was scarcely a peasant who was not indebted to the local Jewish trader. To-day the picture has changed completely. The Jews were massacred in their thousands, or forced to escape if they could, during the Nazi occupation. Most of those left have since emigrated to Israel.

One of Warszawa's sights, too seldom visited, was the Citadel. This, it is important to note, was built by the Russians not to defend the town, but to over-awe it.

In the extreme south of Poland is Cracow (Kraków), which was capital when Warszawa was an insignificant village. Cracow and Lodz are the only great cities which emerged from the war practically unscathed. It is a lovely city, with a charming atmosphere of its own—mellowed by history and its ancient reputation as a seat of learning. It is dominated by the hill of the Wawel. Here is the palace of the Polish kings—designed by Italian architects, and gloriously beautiful. Adjoining it is a cathedral which is *not* beautiful, but which has strong historical associations. In the lower town are two other outstanding buildings. In the square is a stately Cloth Hall, with pillared arcades and picturesque staircases. Close by is the Marjacki, the town church of Cracow. Its two towers are irregular: two brothers were their architects, and one slew the other that his own tower might be the higher. Listen as the hour strikes—by night, for preference, when the noise of traffic on cobbled streets is hushed. You will hear the silvery notes of the *heynal* floating from the higher tower, blown on a mellow trumpet. For hundreds of years a trumpeter has watched day and night on the tower: this is quite common even to-day, when many Polish towns, especially in the east, are almost entirely



THE CATHEDRAL AT Gniezno

Photo Keystone

the old city square. Once the Town Hall stood in the centre: this was destroyed, but the old houses still survived. The square was a blaze of colour, for every house was brilliantly painted with rare patterns and designs. The houses were tall, but of narrow frontage—in medieval days, when they were built, common people might only have a frontage of two windows, nobles three, and princes four.

Next door to the square was the Ghetto, an amazing medley of hundreds of narrow alleys in which the Jews of Warszawa were concen-



COUNTRY SCENES AND TYPES

1 and 3. Peasant girls in national costume. 2. At harvest time. 4. The wayside cross. 5. Thatched barn in the farming country.
6. A mountaineers' band. 7. A religious procession in the district of Lowicz.

Photos. *Orbis Polish Travel Office*

constructed of wood, and a fire watch is essential.

At Cracow the *heynal* ends abruptly, almost on a broken note. It was in 1241 that the Tatars of Genghis Khan ravaged Poland. Surging to Cracow, they reached the market place just as the trumpeter was sounding the warning *heynal*. An arrow through his throat cut short his brazen message, and since that day his successors have halted abruptly at the same place.

Two places in the environs of Cracow are notable. Quite near are the salt mines of Wieliczka, among the oldest in Europe. Fifty miles to the north is Czestochowa, where the famous "Black Virgin" is reputed to work miracles. On a saint's day, 300,000 peasants gather from all corners of Poland to worship at this sacred shrine.

During the 1939-45 War many other cities were virtually destroyed, and though it may be impossible to replace the treasures that were destroyed with them some of the places will gain, on balance, from reconstruction.

The Lakes and the Mountains. To the south of Cracow lie the Tatra Mountains, the scenic corner of Poland. Here are giant peaks topping 8000 feet, with little lakes nestling strangely in the high valleys. These lakes have a picturesque name, "Eyes of the Sea," and

local tradition asserts that they connect direct with the ocean. The district is inhabited by a fine highland tribe, the Goorals.

Even more intriguing is another mountain tribe in the south-eastern corner of old Poland, a hundred miles to the south of Lwów (now in Russia). In medieval days, when Polish nobles fell foul of the king, they fled for sanctuary to the wild mountains of the Czarnohora. Thence they would raid the valleys for food. And, since man does not live by bread alone, they would occasionally carry off the daughters or even the wives of the local peasants. The Huculs are the direct descendants of these romantic matings. Blood will tell, and even to-day they are far superior in physique and intelligence to the neighbouring tribes. They, and most others of the Ukrainian tribes, are Uniates—the Poles generally are Roman Catholics. The Uniates represent a typical compromise of bygone centuries, when rulers sought to change the faith of their subjects. The Uniates follow the rites of the Orthodox church, but acknowledge the authority of the Pope of Rome.

The Lost Towns. The towns of eastern Poland could never be compared with anything in western Europe. Pinsk, a typical specimen, is an amazing place. Built in the Pripet Marshes, it is almost entirely constructed of



THE WEALTH OF THE LAND

A scene typical of the lowlands of central Poland, showing an extensive belt of forest in the background and in the foreground the corn and other crops which the fertile soil produces

Photo Orbis Polish Travel Office



RUINS OF THE TWELFTH CENTURY BENEDICTINE ABBEY AT TYNIEC

Photo *Orbis Polish Travel Office*

wood—and is burned down on the average three times in a century! Of its population of 70,000, no less than 70 per cent were Jews—the biggest proportion in Europe. On market day, half the produce is brought in flat-bottomed boats through winding stretches of rush-strewn water in the marshes: the other half by wooden carts over the dust tracks which were the main roads of eastern Poland. Trading methods are primitive, and barter is as freely employed as currency.

Wilno, farther north, has had a stormy history through the centuries. It was occupied by Poland in 1920, but has now been restored to Lithuania, whose capital it was originally. Until 1940 it was a scene of contention, for the Lithuanians had never given up their claim to their historic capital. The difficulty was that, while many of the villages round about were definitely Lithuanian, the city was considered equally definitely Polish—with a large admixture of Jewish and Russian population.

It was always well worth journeying to Wilno to see the church of St. Anne, classed as Europe's perfect specimen of Gothic architecture. Napoleon admired it so much that he proposed to remove it stone by stone to France. Fortunately, when he returned from Moscow after his defeat he was in too much of a hurry to bother about removing churches. The Ostra Brama, the Sacred Gate, was another of Poland's holy shrines, situated in one of the city's ancient gateways: no matter at what hour of the day or night you passed, you would always see people kneeling in prayer in the street below. The town was at one time the seat of

Polish and Jewish culture, and is still a centre of education. Its principal trade is in timber and grain.

Fauna of the Forests. Over 20 per cent of Poland's area is forest covered, and the forest of Bialowieza, where Poland's eastern frontier borders on the U.S.S.R., is the largest in Europe. It is especially noted for its fauna. Here you may meet bears, wolves, lynx, wild cats, wild boars, chamois, and many other animals: in the forests of the north are herds of elks. In addition, there is the only surviving herd of European bison.

East Prussia and Silesia. It was provisionally settled in 1945 at Potsdam that Poland should occupy the German lands of the south-western part of East Prussia, the territories up to a North-South line formed by the Oder and Neisse rivers and Silesia. No sooner was this said than Poland began to see that it was done, transferring large numbers of Poles from her forfeited Eastern areas.

East Prussia was a domain of big landowners, but in many parts had a leavening of farming settlements. Here there are also extensive forests and lakes, but the south is hilly. Travelling westward we come to the important ports of Danzig and Gdynia. Predominantly German, Danzig was made a free city in 1919 and Gdynia was built to rival it. An artificial port hacked out of Poland's dreary coast line, Gdynia was the first achievement of the new Polish state. Both ports were given to Poland in 1945. Continuing westwards we come to the newly acquired portion of Brandenburg, the fertile marshes of the Oder,

the Warthe and the Netze rivers and to the port of Stettin, formerly in Mecklenburg.

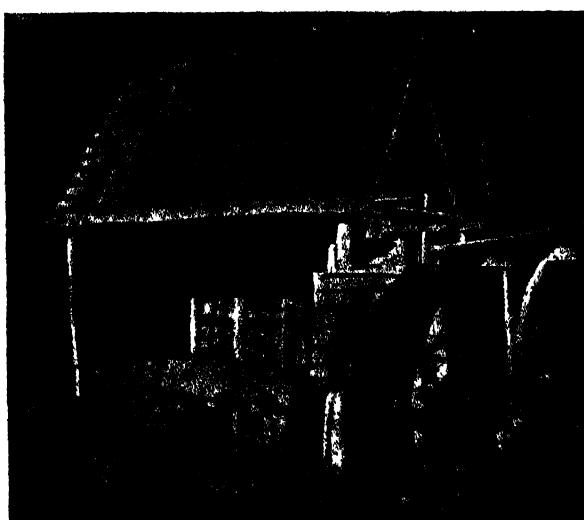
Turning South to Silesia we come across Liegnit and Breslau, also acquired by the Potsdam agreement of 1945. Only the triangular area between Gleiwitz, Hindenburg, and Beuthen is a heavily industrialized mining district. Up to Oppeln, the other part of the province, the Oder Valley is arable and pasture land. Not far from the industrial region we find extensive woodlands. Lower Silesia is one of the most varied parts of Europe; it combines vast lowland plains, offshoots of the North German plain, with a number of considerable mountain ranges: the south eastern branches of the central German mountain country. The collective name for these mountain ranges is Sudeten Mountains. The chief parts of the Sudeten are the Giants' and Iser Mountains, the Waldenburger mountain country; a coal district between Landeshut and the Glatzer Gorge; in the south-eastern part of the Sudeten are the Altwater and Oder Mountains, where the River Oder has its source. The Oder is Silesia's chief river and its valley forms the largest part of the fertile Middle and

Lower Silesian plain. The mountains contain a number of world-famous spas: Salzbrunn, Kudowa and Reinerz, among others.

Geographically Poland is one of the simplest countries in Europe, its great plain sweeping almost unchecked until it merges in the mountains of the south. Its river system is almost monopolized by the important Vistula and its tributaries and, since 1945, by the Oder in the west. A vast plain does not make for fine scenery, and its most ardent admirers would hardly claim Poland as a land of loveliness. It may be that, due to lack of scenic grandeur, and consequent less appeal to tourists, Poland is less well-known amongst Europeans than she deserves.

Nowadays, of course, she is completely cut off from all contact with western European countries. Since 1947 a Soviet-inspired system has prevailed, watched over by secret police. Reconstruction in both town and country has made great progress, however, and since 1948 Poland's output has been mounting steadily, so that her economic position is sounder in spite of the fact that as a satellite of the U.S.S.R. she was unable to accept Marshall Aid.

Romania



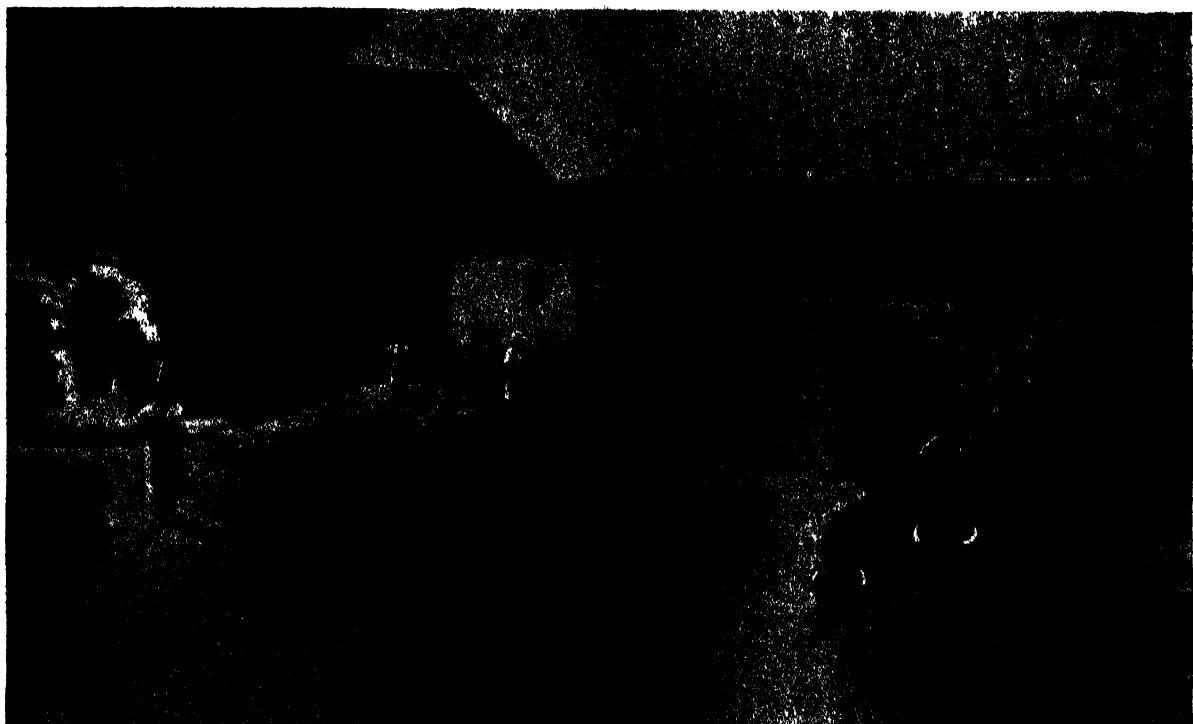
PEASANT GOLD MINING
Primitive mill for extracting gold at Reusa Montana, near Abrud,
Transylvania
Photo: D. J. Hall

IN general shape, Romania is a compact, solid-looking country, with no deep indentations on its outline, and rather broader than it is long. The distances from its farthest points are about 475 miles from west to east, and 375 miles from north to south. It has a total area of 91,671 square miles, which is some 3000 square miles greater than the area of Great Britain, has four immediate neighbouring countries and the Black Sea. Moving clockwise around the frontiers, there is, on the south, Bulgaria, stretching for some 300 miles from Mangalia on the Black Sea to where the Timok flows into the Danube. Next, on the southwest, comes Yugoslavia for about 175 miles; then, on the north-west, Hungary, for about the same distance. The whole of the rest of the Northern and Eastern frontiers is bounded by Russia. After Bukovina the frontier runs south-east for about 350 miles, dividing Bessarabia from Romania (ceded to Russia by the 1947 Peace Treaty). Finally, completing the

circle, is the Black Sea, from the mouth of the Danube to the Bulgarian frontier, 100 miles away. These frontier mileages are more as the crow flies than exact, since the myriad slight indentations on the frontiers would tend to complicate what is intended to be a comparative picture of Romania's position in relation to her neighbours.

Geographically, Romania has something of everything, and all, more or less, to an equal degree; mountains, plateaux, forests, hills, and

The Cradle of the Romanian People. Within this arc, which encloses all of the north-western half of Romania, lies the Transylvanian plateau. The Romans called it Transylvania because it was beyond the great forests of the Carpathians. Ardeal, the Romanians call it, a land of hills. To one standing on the slopes of the mountains, and looking out over the plateau, the land appears like a billowy quilt. Everywhere is a seemingly infinite number of hills and valleys, of pasture and of cornfields,



THE ROMANIAN PLAIN

A small farm on the plains where the ox and buffalo are still the principal beasts of burden and the dwellings of the peasant farmers are small and old and often built partly of timber

Photo: *Wide World*

plains. The most striking mountain feature is the magnificent arc of the Carpathians. From the gorge of Kazan and the Iron Gates on the Danube, where the river has forced its way through the barrier, the Carpathians sweep north and eastward to beyond Brașov in the very centre of the country. There, they turn north-westward to the borders of Czechoslovakia. The south-eastern portion of this arc, generally known as the Transylvanian Alps, is the highest, rising to 8320 feet in the Făgăraș Mountains, the peak of Negoiul being the most well-known. Farther west, the altitude becomes lower as the mountains approach the Danube gorge.

undulating to the horizon. Only, due west, stand the Apuseni Mountains, a very ancient formation, which do not rise to any great heights. This arc of the Carpathians, bestriding the land, is the cradle of the Romanian people. It would seem that it might have always formed a barrier between Transylvania and the Regat, the Old Kingdom. But, throughout its length, there are numerous passes which have always been means of communication; though culturally, as always exist between the north and south of a country, there are differences.

Southward, down into the Old Kingdom, the mountains decline gradually to beech-forested hills till the land flattens out into

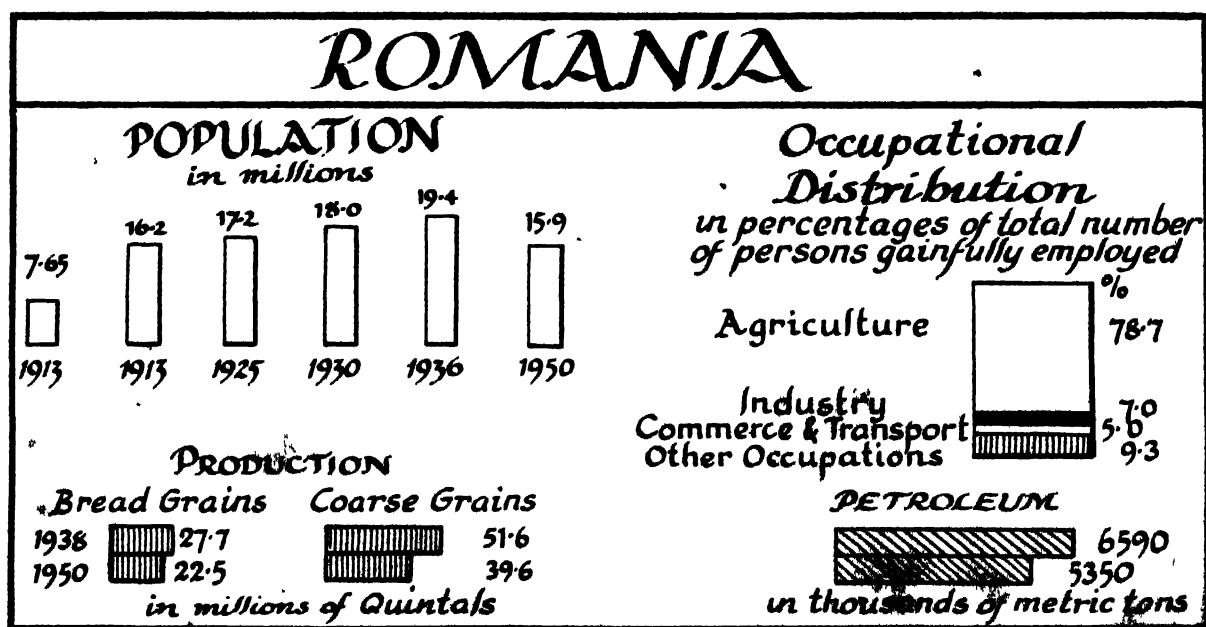
the Danubian plain. The main thoroughfare through the mountains has been from ancient times the Valley of the Olt. This river, rising in the eastern Carpathians, flows along the north side of the southern Carpathians till it breaks through the mountains at the pass of the Red Tower, and thence flows due south till it joins the Danube at Turnu Magurele. In much the same way, the eastern Carpathians decline to forested hills, to the great wheat plains of Moldavia, and then, beyond the bordering River Prut, to those of Bessarabia. The Prut, rising in Russia, flows the whole length of the border from north to south till it joins the Danube some 50 miles before the delta. The ceded Bessarabia, which ends at the Dniester, is steppe land, and in years of good harvest is a sea of wheat. In fact, from the Prut to the Dniester, and beyond the land seems to roll without end.

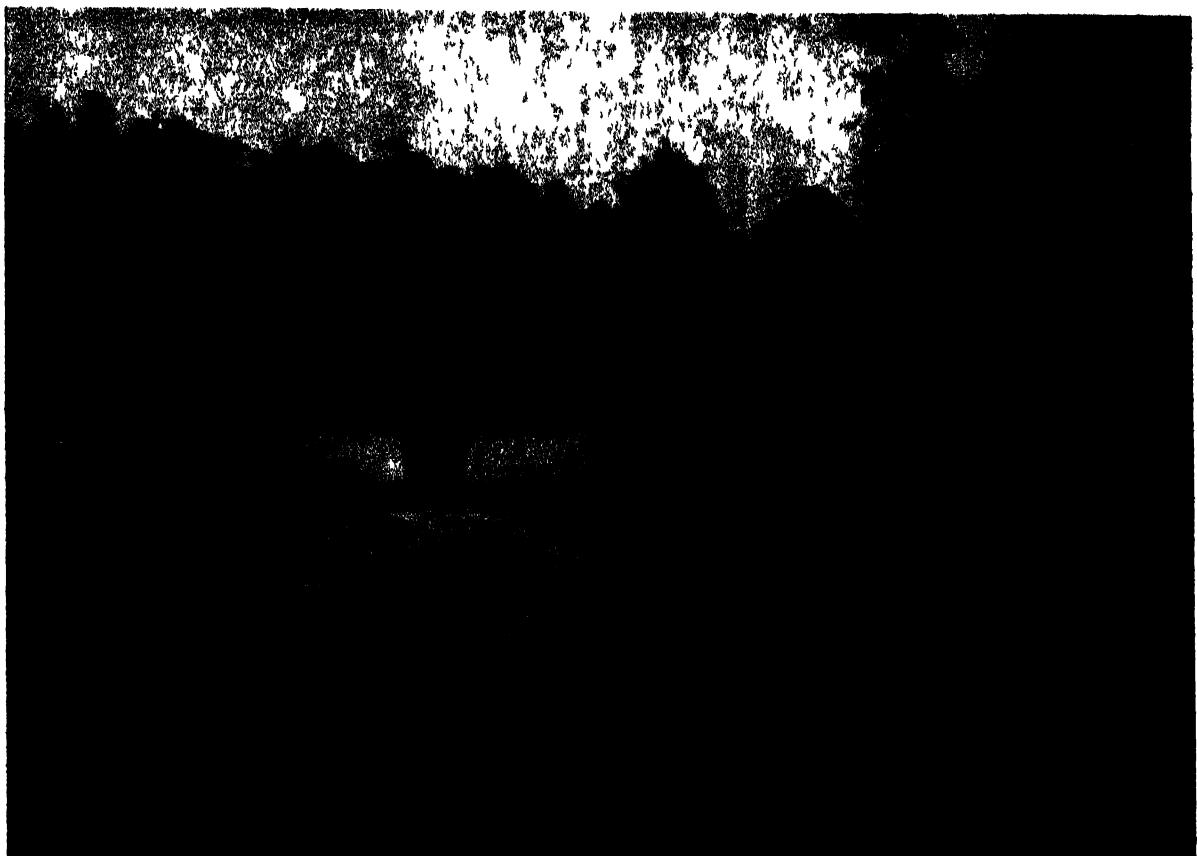
Spaciousness with Constant Change of Scenery. In brief, the picture of Romania is of a slightly flattened ball, with a great central arc of mountains embracing to the north-west the plateau of Transylvania, with its eastern and southern slopes falling away to fertile plains. In general there is a feeling everywhere of spaciousness. For, although the country is not large, there is infinite variety. In the mountains and hills, every few miles brings a change in scene, so that it seems as though the country itself is moving constantly; and in the plains there is no limit to the view but the horizon. Yet, with all this sense of vastness,

which is one more of a continent than of a country little larger than Great Britain, the scenery is never overpowering. The landscape, though strong, is gentle, and gives to the stranger a feeling of tranquillity. *Simpatic*, the people call it; and *linisit*, a word not easily translated, but conveying a calm, serene quality. Its significance is greatest in the autumn, when the year's labour is ended; then a blueness hangs over the countryside, and voices carry great distances: there is a sense of the whole land sinking to rest, growing more and more still towards the winter's sleep.

Indeed, it is hard to speak in precise terms of the mere geographical aspect of Romania, since there are few countries where the land and the people are so closely allied, where the shape of the land, the turn of the seasons and the lives of men are so interwoven. It is this which makes a stranger feel quickly at home. For the outstanding quality of the Romanians is their kindly hospitality and their immediate response to friendliness. They are also characteristically slow to take offence. It is the country people, the peasants, who are Romania. Out of a population of about sixteen millions in 1950, some eleven millions lived on the land, and farmed two-thirds of the country.

In describing the people and their way of life, it is essential to consider their poetry, since in this is found the key to their character. Romania possesses some of the most beautiful





A PEASANT CABIN

One of the typical hill farms in which will be seen the curiously-shaped hay stacks and the pigs, which each represent part of the livelihood of the hill peasants in the district of Arges, where small holdings are numerous and mixed farming the rule

Photo · D J Hall

folk-poetry in the world. The peasant-poet sees the world as harmonious, there is always before him the cycle of birth, growth and death. It is this unchangeable harmony which moves him so deeply, for he feels that no effort he may make can change it. But it is no pessimistic submission; in his saddest moments he expresses a nuance of optimism. For, in accepting an harmonious world, he knows that if the balance is upset it must inevitably be restored. He is serene, peaceable, but in his solitude the shepherd feels an inner disquiet which reveals the secrets hidden beneath his smile. He perceives the ordeals of life, and finds in the simple and well-balanced form of his poetry the harmony to which he aspires. His comprehensive word, *dor*, expresses his philosophy; love, sadness, longing, regret, nostalgia, all permeated with hope.

Though with better communications, and the invention of more modern agricultural implements, the way of life of the people is

slowly changing, it remains, in its essentials, the same as it has been for centuries. There may be cigarettes, newspapers, country motor-buses to rattle the peasants into a town where they may, perhaps, go to a cinema; even there may be, in some villages, a wireless set. But these things have not yet greatly affected the people. The reason for this is that the basis of their life has not been touched. Western Europe's standard of living is based on money; the Romanian peasant is almost entirely self-supporting.

Influence of Ancient Rome. A slight digression is necessary here, for any description of a people's present day life is incomplete, and not to be understood fully, without some reference to its history. In A.D. 101, the Roman legions under Trajan crossed the Danube somewhere near the Iron Gates, in order to subdue the Dacians. These Dacians, who later on intermarried with the Roman colonists and legionaries, were the forefathers of the people

we call Romanians. "Dacia Felix" became the name of the province, agriculturally prosperous as it is now. Although the official Roman occupation ceased in A.D. 271, a period altogether of only 170 years, the Latin influence was remarkable. From before the occupation to long afterwards, Roman traders and colonists came to the country. The most notable legacy was their influence on the language, which, in spite of Slav and Turkish infiltrations, has



WINDMILLS USED FOR GRINDING CORN IN ROMANIA

Photo Romanian Legation

remained fundamentally a Latin one. What is most significant, is that the way of life of the people has changed so little. This, in spite of the fact that the country was a highroad for the Asiatic tribes that swept into Europe. Only the Slavs left any great mark behind them, and this was mainly in the systems of agriculture and social organization of village life. One small example signifies the absence of change; the carvings on the column of Trajan in Rome, which commemorate the conquest of Dacia, show peasants wearing the same clothes as the Romanian peasants wear to-day.

Effects of Agrarian Reform. In 1918, a long-considered scheme of Agrarian Reform was realized. For political reasons, and for

those of social justice, the King and the land-owners themselves joined in the re-distribution of the land. In the Regat, the Old Kingdom, estates were limited to 500 hectares (1 hectare is 2.471 acres) plus vineyards, orchards and woods. The same applied to Banat, the most western district and to Transylvania. In the Bukovina, to the north-east, where farms were smaller and much of the land was covered with the beech-forests that give the province its name, estates were limited to 250 hectares. In Bessarabia, the province now ceded to the U.S.S.R., not more than 100 hectares could be retained. After the 1939-45 War further reforms limited estates to 50 hectares. At the same time existing peasant holdings were increased, and new small individual holdings created. Romanians do not believe in work for its own sake or for the amassing of money, however. They work in order to live. They have an appreciation and a capacity for the intelligent enjoyment of leisure, the recapturing of which is one of the problems set for modern civilization. Their working lives are in any event sufficiently hard.

Though the spring and autumn are calm and beautiful, the winter is severe, with the temperature often falling to -30° , and in the summer the temperature is often higher than 100° . These extremes of cold and heat are felt most on the great wheat plains. The spring is short, and an immense amount of work has to be done immediately the snows are gone, and before the baking heat of summer sets in. All through the summer the work continues, keeping the ground in good heart, attending to the growing crops, the hay, the orchards and the cattle. The autumn is again a time of accelerated activity, the harvesting, the storing away of the maize in barns against the coming winter. At night the villages are filled with music of the fiddles and *timbala*, as the people gather to the *curățat de porumb*, the husking of the maize. It is the most impressive time of the whole year, and a stranger coming to the country then experiences a sense of fulfilment, of the richness of the Earth.

Thereafter, day by day, the activity lessens, the movements of the people become slower, the whole tempo of existence gradually changes. An extraordinary peacefulness envelops everything, as the Earth settles towards the rest of winter. The cycle of the year is completed. During the winter the country is snow-covered, and the wolves come near to the villages, there is little work to be done outside. It is then that



A COUNTRY TOWN OF EAST CENTRAL EUROPE
Nachod dates from medieval times. The houses of the townsmen still lie in close proximity to the castle, a reminder that once, in this part of Europe, such proximity afforded the sole hope of security from bandits and hostile armies

(G.109)



RURAL LIFE

1. A shepherd and his flock on a spur of the Carpathian Mountains. 2. Watching the grape-pickers at harvest time. 3. Loading the corn on to an ox-wagon. 4. Peasants in national costume dancing at a harvest fete. 5. A minstrel of the pastures. 6. A shepherd of the plains in a typical cloak of sheep's wool

Photos: D. J. Hall; *Wide World*; *Romanian Legation*

they prepare for the coming year. Sitting around their fires, the men look to their tools and talk, while the women weave, make and embroider clothes both for themselves and their menfolk.

But, and it is a large "but," in considering the general economic position of the country, the people rarely cultivate more of their land than is necessary for the upkeep of their own immediate families. They may produce a slight surplus, say of vegetables or fowls, though their yards are always filled with geese and chickens and piglets. But this, as a rule, is only so that they may raise a little money for new tools or some necessity which they themselves cannot satisfy. They are not interested in the acquisition of money. Since they have no need of it, the amount of extra labour that would be required seems to them absurd. It is not the outcome of laziness, but of a well-balanced philosophy. Nevertheless, it has a double edge. Three-quarters of the population may be thus contented and self-sufficient. But what of the rest?

How Rural Practice Affects the Towns. The peasants are not skilled agriculturists, they still work on old-fashioned methods. In proportion to the ground used, the crops are often poor, and a good deal of land is not worked at all, because their needs are so small.

The re-distribution of land to millions of small-holders, and their consequent happiness, has reduced the export of grain. This affects the national income and the townspeople. The result of the peasants not setting great store by money for themselves is that there is a general scarcity of money. There is one thing that is really cheap, food. The soil is rich, and, though there may not be a surplus for export, there is an abundance of everything to eat. At the moment there are experiments in collective farming being carried on throughout the country. In this way it is hoped that by the introduction of modern methods and machinery, inaccessible to any one peasant, the cultivation will be speeded up and production increased. Meanwhile, in spite of the economic difficulties with which the Government has to contend, by far the greater proportion of the people are very well off as they are.

The People. Although the true Romanian is to be found everywhere in the country, the most unmixed in blood live in the villages on the slopes and in the valleys on both sides of the Carpathians, that arc which sweeps through the centre of the country from Botosani in the north-east to Banat in the south-west. Here are to be found customs and habits of speech which elsewhere have disappeared.

Physically, the Romanian has, as a rule,



TRANSPORT OF TIMBER

Timber being transported down the river from the forests of the interior to the sawmills

Photo: Romanian Legation



THE WEALTH OF THE COUNTRY
A panoramic view of the derricks in the chief oil field at Romania, in the Prahova Valley
Photo: Romanian Legation

dark eyes, hair and skin, and is strong and stubborn, though not largely-built. The women are remarkable for their good looks. They are sympathetic, honest people, and easy to understand. Their natures are gentle and affectionate, and they have a great love for children. In general they are quick-witted, slow to anger, and swift to laugh. Their intelligence, combined with excellent education, has given them an extraordinarily wide interest for people in their situation. In addition to their natural gift for poetry, they have a great store of music; much of it traditional, though fresh composition continues all the time.

In almost every village there is on the outskirts a small colony of gypsies, who may be brickmakers, or coppersmiths, and so on. It is the gypsies who play the music for the dancing, the instruments being, as a rule, a fiddle, a lute and a *timbala*. The pan-pipes, on which much of the loveliest music was once played, are to be heard now only rarely and in remote places.

In a typical village, every house is a miniature farmstead. The little houses do not face the dusty village street, but stand sideways to it, looking out over their yards. A house rarely

has more than three rooms, and, usually, only two; one in which the family sleeps, and the other in which it sits in the winter-time. The houses are white-plastered, with grey, wooden tiles; often they are painted gaily with a red and blue frieze, and have baskets of flowers hanging on the verandahs. For the houses have their foundations rising above the ground, with steps up to the verandah, the pillars and rail of which are often finely carved.

National Dress. The clothes of the people are in essentials the same everywhere. The men wear thick white cotton or woollen trousers, rather tight-fitting, and a white collarless smock with full sleeves, belted at the waist and hanging loose over the thighs. The women wear a very full, straight-cut, heavy cotton dress drawn in at the waist, and with sometimes a full sleeve and sometimes a sleeve tight at the wrist. Over it, they wear an apron bound around the skirt. In summer, both men and women rarely wear anything beneath these clothes. The women go barefoot, the men wear shoes of leather made in one piece and bound over the top of the feet. In winter they wear the *cojoc*, a sheepskin coat, and a *caciula*, a round, sheepskin hat, usually black. But they

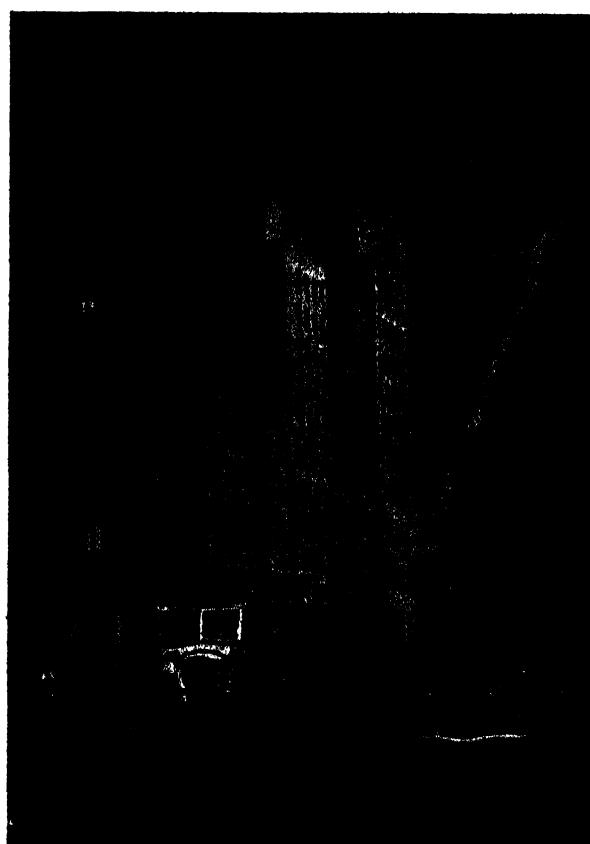


WOODEN CHURCH AT MARAMUREŞ
Photo Romanian Legation

are extremely hardy, and do not seem to feel seriously the extremes either of heat or of cold. The most remarkable feature of their clothes is the embroidery. Even their ordinary working shirts are gaily decorated, while their best ones, and the dresses of the women, are exquisitely worked. While the patterns vary greatly even in the same districts, there are certain key differences among the districts which make it possible to tell to what part of the country an individual belongs. Although communications have always been limited, and the country to a great extent divided up, there is little noticeable dialect. The language has remained, in spite of everything, intact.

Peasant Customs. To their natural conservativeness is perhaps due the survival of customs so ancient that the peasants themselves have often no idea of their origin. In some cases they have been incorporated in the religious observances of the Orthodox Church

to which they belong. The *pomand* is one of the most interesting. It is a survival of the Români custom of feasting the dead; the food and drink consumed being intended to support the dead man on his journey to the next world. Three *pomandă* are held, the first on returning from the funeral, the second after eight days, and the third, as a rule, at the end of six weeks. The funeral cake, the *coliva*, is of corn, nuts and honey, and is made according to the Români recipe. In Transylvania, before he is buried the dead man lies in his house with his feet to the open door so that his spirit can walk out and in his right hand is a coin to pay Charon for ferrying him over the Styx. No knife lies with blade uppermost in the house, lest his soul should ride on the blade. When the coffin has been lowered into the grave, the priest blesses the bread that will feed the deceased on his journey. It is then put at his head; one big loaf, the *noporogna*, and seven small loaves *colaci*, one for each day of the week until the second *pomandă*. At this ceremony is often heard



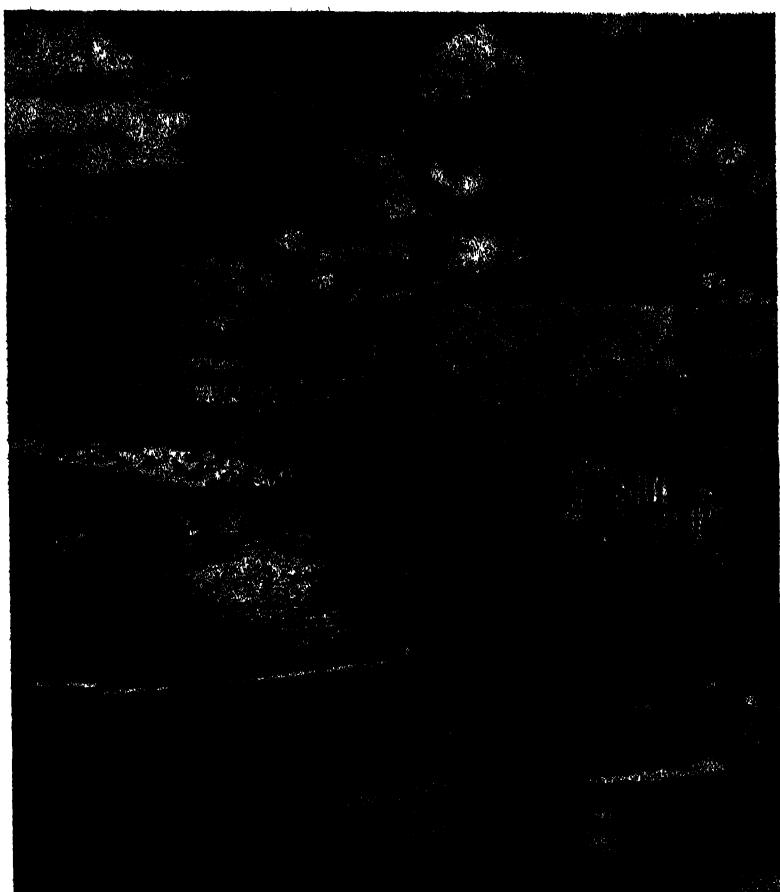
THE CITY OF BUCURESTI
Modern transport and modern architecture in the shape of the new telephone building are well represented
Photo: Planes

the lamentation made by a relative of the dead; it is usually extempore, delivered in a Biblical prose most beautiful to hear. Many of the purely pagan survivals are from the Greek, particularly the myth of Aphrodite and Adonis. This is exemplified in the *paparuda*, the spring ceremony for producing rain. Some of the songs connected with it have become merged in the mother and son motif of Christianity. It is indeed often hard to tell where the ancient religion ceases and Christianity begins, so inextricably mingled are the two in many of their customs.

Resources and Productivity. Before considering those major industries which are of importance to the country as an exporter, there are a number of valuable and no less interesting activities.

Fisheries. The Danube teems with fish. In its immense delta, the fisheries, which are a State monopoly, bring in a considerable annual income. The sturgeon caviar, in particular, is of the very finest quality. Most of the fishermen are Lipovani, who live during the height of the fishing season in rush hammocks swung between the willows in the swamps. In these swamps and lagoons exists a variety of bird-life which is one of the most remarkable in the world.

Wines. A great quantity of good wine is produced, the vineyards of Cotnari and Drăgăşani in the Old Kingdom being among the most notable, although wine is more generally drunk in Transylvania than in the Regat. It is in the main a clear, dry wine, the white being the best. There are few districts in Europe to rival the best *vin du pays* in Romania. That it is not known outside the country is owing to the difficulty of export. The vineyards are so scattered, and their operation so varied, that any true classification is well-nigh impossible. And without this classification, export cannot be carried out. What is more generally drunk in the Regat is *fiuica*, of which great quantities are distilled from plums. It is as pure a plum brandy as is found anywhere; a tribute to its



THE SILVER COAST

A view on the Cote d'Azur, Romania's most famous holiday district

Photo: Keystone

purity is the health of the peasants, who consume a good deal of it. In the towns it is drunk as an aperitif.

Mineral Springs. These, though little known outside the country, are some of the finest in Europe. The most notable of the health resorts are Govora, Calimanesti, Sovata, Slanic, and Tekirghiol, the last being famous for its curative mud-bath for rheumatism.

The principal exports of Romania are petroleum products, cereals, seeds, timber and cattle. The largest oil field is at Moreni and the centre of the industry is Ploesti, where there is a large number of refineries. Principal imports are cotton and woollen yarns, textiles, machinery, motor-cars, rubber tyres, hardware, chemicals and colours. Since the war practically the whole of the country's economic resources have been State-controlled.

The Towns. In contrast with the peasants, the people of the Romanian cities bear the earmark of any city-dweller of western Europe.

Most young Romanians, who can afford it, used to go abroad to complete their education, attending French, German, or, before the war, English colleges and universities. There are in Romania the excellent universities at Jassy, Bucureşti, and Cluj. Other towns of considerable interest and of very ancient foundation are Braşov, the Saxon Sibiu, and Sighişoara in Transylvania. Outside the towns, the old seats of culture, the monasteries, are some of the most remarkable to be seen anywhere. The most famous are the frescoed churches of Campulung. To foreigners, however, the capital city is better known than any of these.

Bucureşti (Bucarest), situated in the south, in the Danubian plain and fifty miles from the Danubian frontier, cannot be reviewed in the same way as the capitals of most other countries. Its chief claim to interest does not lie in outstanding beauty of architecture nor in ancient monuments. Neither has it yet achieved that dull uniformity, the cosmopolitan atmosphere, which is common to most capital cities. There is little plan in its lay-out; it has grown simply at its inhabitants' inclinations. It expresses the philosophy of those who live there; the past is not to be regretted, nor the future feared, the present is important. Its carefree, almost careless, air expresses, too, the deeper optimism of the saying that "nothing is ever so bad that it could not be worse." Its very origin is obscure. The legend says that a

shepherd named Bucur was so drawn to the beauty of this place by the River Dâmboviţa, that he built there a shrine. That is said to have happened 700 years ago. There is now a church of his name in Bucureşti (Bucarest). So far as can be known, however, there was only a fortress there to guard the route to the old capital of Wallachia, Târgovişte.

Now, the city covers a huge area. Although its population could be fitted nine times into London, its area is almost as great as that of Paris. And here again it is the nature of the people that has made it so. Inherently, Romanians desire land where they can grow things. So, outside its small centre, where the shops, theatres and government buildings are grouped within a short walk of the Royal Palace, every house has its garden. There are, as well, public parks such as the Cismigiu, which are well kept and filled with flowers, and the shaded Boulevard Kisselef, which runs for several miles till it reaches the country. There is Cotroceni, the one time palace of the Queen-Mother, with its park and stadium, and the new Royal Palace built by King Carol II in the heart of the city. In general the architecture of the city shows a French influence. The strictly native architecture is inclined to be Byzantine in feeling. It is, perhaps, the very lack of historic buildings which gives the city its homely atmosphere. It may be gay, it may, in its superficialities, be modern; but it is not hard.

POST-WAR EUROPE

THE defeat of the axis nations in 1945, after six years of war, was due to a combination of superior industrial capacity, greater access to raw materials and the larger populations of the U.S.A., United Kingdom and the U.S.S.R., as well as to the close military and political co-operation between the Allies. The death of Hitler, the fall of Berlin and the junction of the U.S. and Soviet armies within Germany all helped to hasten the end of the struggle. First the German and Italian armies in northern Italy surrendered, on 2nd May, the same day that Berlin fell. Two days later another force of about one million troops in Holland, Denmark and north-west Germany surrendered, and on 5th May the troops in eastern Austria were commanded to lay down their arms. The Allies insisted, however, on unconditional surrender, and on 7th May resistance on the eastern front against the Soviet forces ceased and a final surrender document was signed by German emissaries at General Eisenhower's headquarters at Rheims. On 8th May similar documents were signed in Berlin by the Chief of Staff of the German High Command, and a cease fire was ordered on that day.

It was not until 8th August, three months after the surrender of Germany, that the Soviet Union declared war on Japan and subsequently invaded Manchuria. This event, together with the dropping of atom bombs on Hiroshima and Nagasaki, finally brought about the end of the war in the Far East and the Japanese accepted the terms of unconditional surrender laid down by the Allies. Documents to this effect were signed on board the U.S. battleship *Missouri* in Tokyo Bay on 2nd September, 1945. So the bitterest war in history was concluded, six years and a day after it commenced by the German invasion of Poland on 1st September, 1939.

The Berlin Conference. In July, 1945, the heads of government of the U.S.A., Great Britain and the U.S.S.R. met in the Potsdam district outside Berlin to determine future policy with regard to Germany. Decisions reached included the establishment of a

Council of Foreign Ministers of the three powers, together with those of France and China, the agreement of the treatment of Germany after the initial period of control and a plan for the settlement of reparations claims.

Although it was no part of the Allies' policy to keep Germany permanently crushed economically, they insisted on complete disarmament and demilitarization, the destruction of war potential, rigid control of industry and decentralization of the existing political and economic structure, entailing the dissolving of the Nazi party and the German General Staff.

The Paris Peace Conference. A Peace Conference took place in Paris from July to October, 1946, at which twenty-one nations were represented. Territorial issues made at this conference included the following—

From Finland: The Petsamo area was ceded to the U.S.S.R. The U.S.S.R. obtained a 50 years' lease on Porkkala.

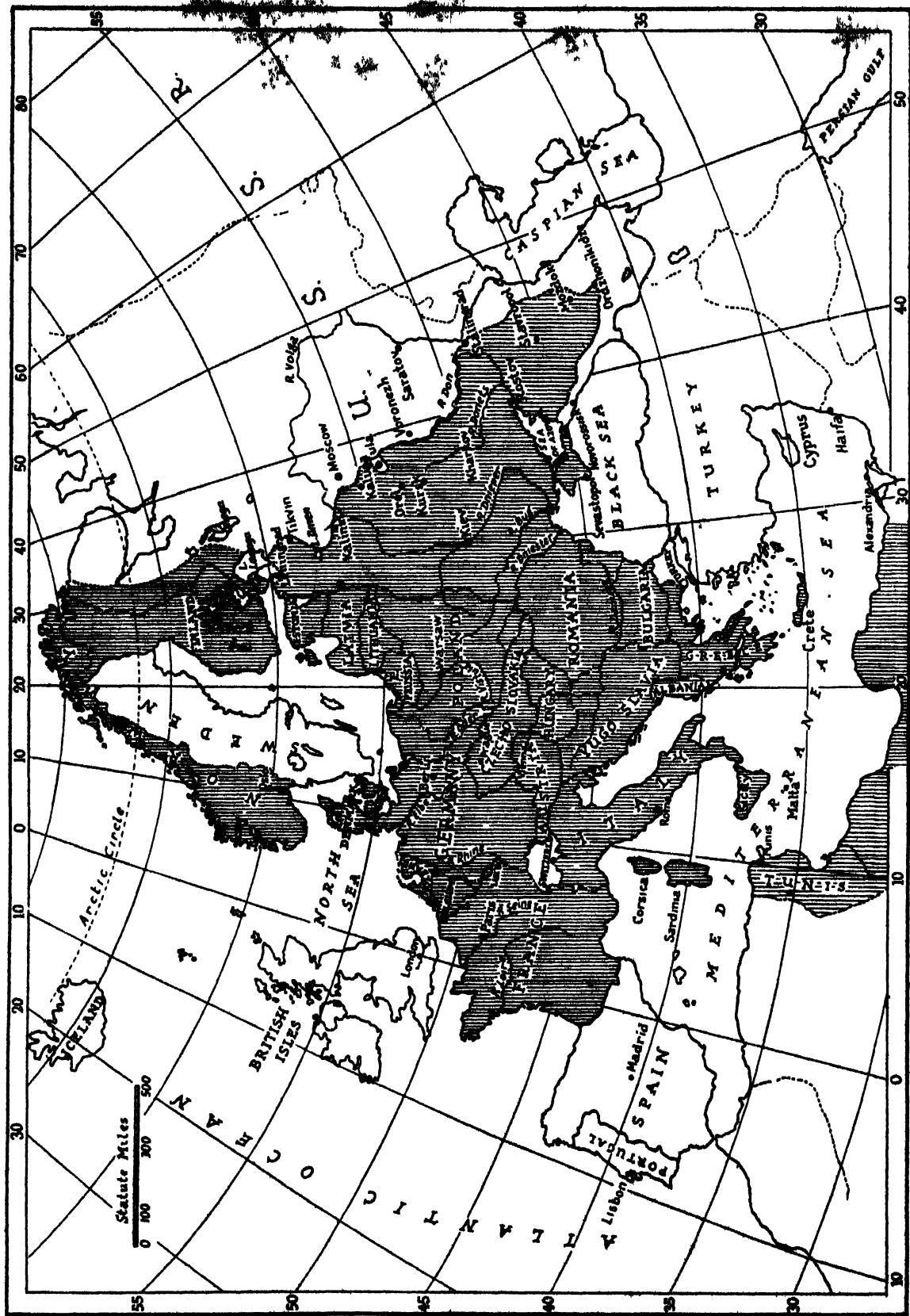
From Italy: Five small Alpine areas were transferred to France. The Free Territory of Trieste came under United Nations supervision. The greater part of Venezia Giulia was ceded to Yugoslavia. Zara and the Adriatic Islands also went to Yugoslavia. The Dodecanese Islands were returned to Greece.

From Hungary: The Danubian enclave near Rajka was transferred to Czechoslovakia. North Transylvania was returned to Romania.

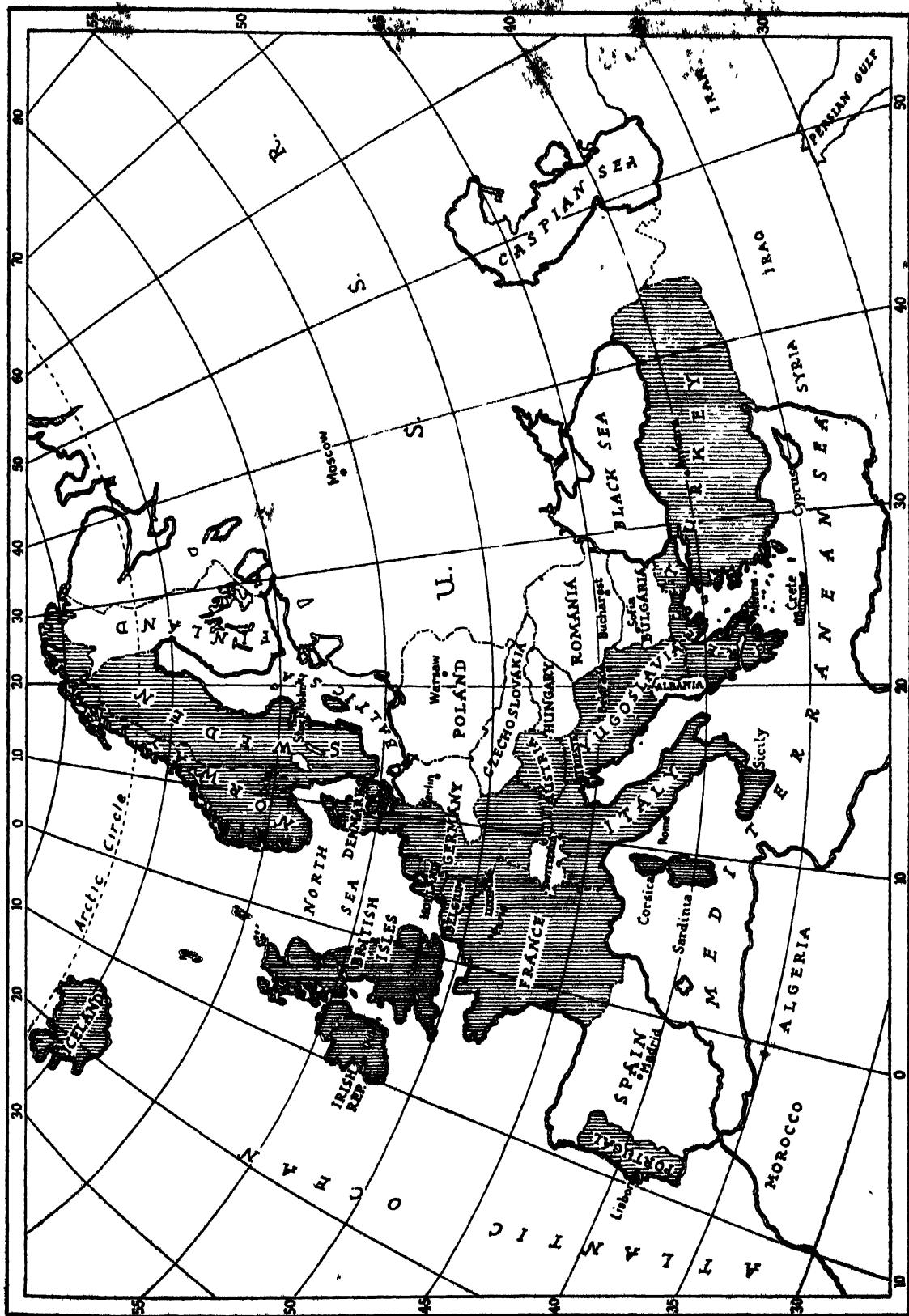
From Romania: Northern Bukovina and Bessarabia went to the U.S.S.R. Southern Dobruja was ceded to Bulgaria.

The European Recovery Programme. The European Recovery Programme (E.R.P.), popularly known as Marshall aid after the former United States Secretary of State who suggested it, was initiated by the U.S.A. to help European recovery after the war. The aim was, through government grants and loans, to assist certain European states to achieve independence from outside economic aid by 1952.

The programme was inaugurated on 1st July, 1948. The countries it was designed to benefit



Europe at the Height of the German Conquests (Shaded Portions) in World War II



THE EXTRACT OF MARSHALL AID TO EUROPE

The shaded area covers the countries that received assistance under the Plan (and in eastern boundary provides incidentally an effective guide to the position of the so-called "Iron Curtain")

were Austria, Belgium, Denmark, France, Greece, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Sweden, Switzerland, Turkey, and the United Kingdom, together with Trieste. In addition, aid to Western Germany was to be made through the occupation powers, but towards the end of 1949 this arrangement was changed so that aid was made direct to the Federal Republic. In the years that followed Switzerland felt itself economically strong enough not to avail itself of the assistance offered, whilst Yugoslavia, although declining the original invitation to take part in the programme, was eventually obliged to seek indirect assistance under the scheme.

During the year ending 30th June, 1949, the U.S. made available \$4,875 million in grants and loans for purposes of E.R.P. This substantial aid made possible progress which could never have been achieved by the efforts of the individual countries alone. Production generally reached pre-war levels, while the steel, coal and bread grains output in Europe as a whole exceeded the pre-war figures.

For the following year ending 30th June, 1950, the U.S. appropriated \$3,628 million for E.R.P., and the grand total by the end of 1951 had reached approximately \$12,500 million. The chief recipients were the United Kingdom, France, Western Germany, Italy, and the Netherlands, who between them had enjoyed the benefits of nearly three-quarters of this colossal sum.

The original European Recovery Programme terminated on 31st December, 1951, and was replaced by aid administered by the Mutual Security Agency, a body set up by the U.S. Mutual Security Act, 1951, and charged with the duty of co-ordinating all foreign aid programmes but with the emphasis on rearmament and security rather than on economic recovery. For 1952-3 the total for Europe appropriated by Congress under this head was \$4411 million out of a world total of \$6032 million.

Exchange Control. In September, 1949, the strain on the gold and dollar resources of the sterling area had become so acute that it was necessary to devalue the pound from 4·09 to 2·80 U.S. dollars, a devaluation of 30·5 per cent. Changes in the exchange rates of many other countries followed quickly. In spite of the dollar deficit of the sterling area being more than covered by E.C.A. (Economic Co-operation Act) assistance, the international economic position of the United Kingdom became very vulnerable at that time.

In general, it may be said that the International Monetary Fund, officially inaugurated on 27th December, 1945, and one of whose purposes is "to promote exchange stability, to maintain orderly exchange arrangements among members, and to avoid competitive exchange depreciation," has, together with the International Bank for Reconstruction and Development (also conceived at the Bretton Woods Conference of 1944), played an important part in the post-war years in helping to meet the balance of payments difficulties of individual European countries, while the creation of the European Payments Union in July, 1950, has facilitated the elimination of trade barriers among its member countries and extended to intra-European trade the basic principles of banking. But the enormous burden that rearmament has imposed on the European economy more recently in the shape of shortages of raw materials and the draining-off of manpower must inevitably militate against the efforts to re-establish stable conditions, both internally and externally, in the countries concerned.

Political Boundaries in Europe To-day. Although a book such as this should avoid politics, geography and politics are to-day so inextricably mixed that it becomes impossible to do so. A picture of post-war Europe would not be a true one without reference to the Iron Curtain, for instance. This boundary is a purely political one and is as hypothetical as the old schoolroom definition of the equator. It would be hard indeed to draw the Iron Curtain on a globe, since many countries would have to be marked with a question mark as being border-line cases. The Iron Curtain effectively divides Europe into two sections. Behind it lie the Communist "Peoples' Democracies" and on the other side are the old Western Democracies. The barrier, however, is by no means confined to Europe and in fact it embraces the whole world.

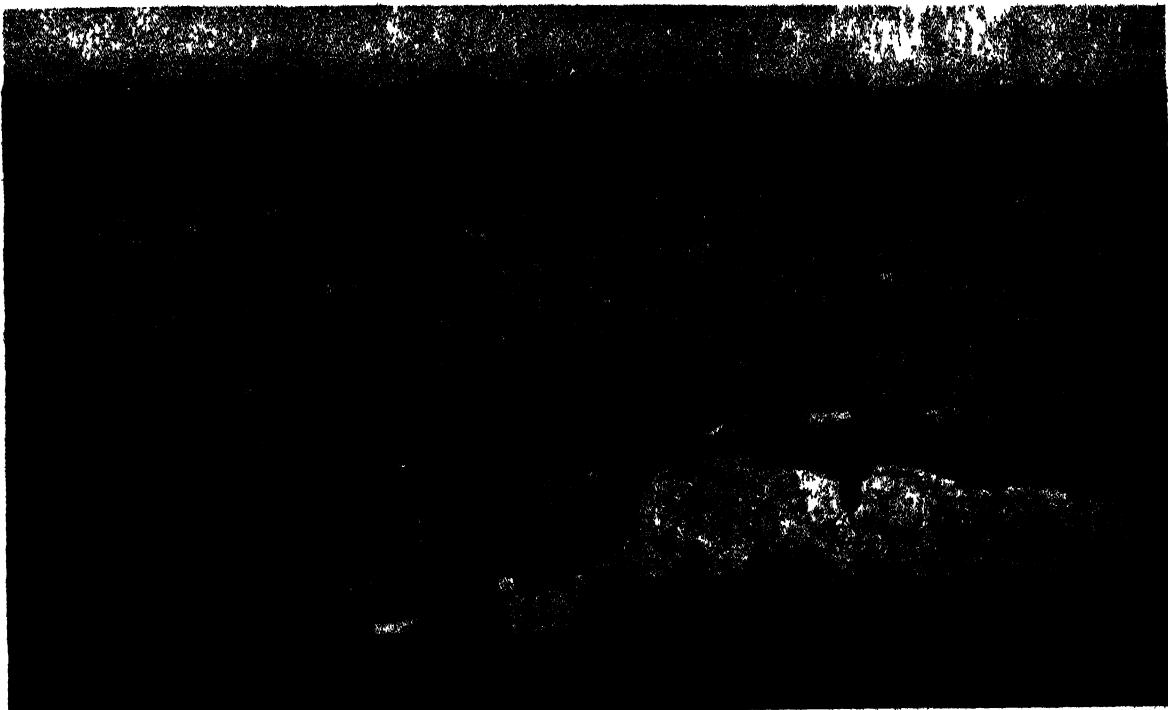
In the Introduction the growing ease of communications throughout the world has been emphasized. To-day, in one respect this is no longer true: the traveller is restricted in his movements, and censorship and distortion of facts prevail to such an extent behind the Iron Curtain that this half of the world has literally no idea of how the other half lives.

The vast changes that have taken place all over the world during the last few years have shaken the whole foundations of modern civilization. Standards of living have changed,

and in many countries poverty is rife. In some cases this is due to the rapid change-over from agrarian life to industrialization. While essential workers are generally adequately provided for, those not engaged in industrial work are often living under conditions approaching starvation. This state of affairs seems to be almost inevitable in the initial stages of industrialization if the process is hurried too much. Production is often disrupted as new methods are tried out.

same significance as it has for us. The youth of these countries to-day has no contact whatsoever with the west and is necessarily Communist since there is no other choice. Communist ideology leads to the belief that the ultimate benefits of the regime will be shared by all alike, and it is by this hope that millions are inspired.

The U.S.S.R. The U.S.S.R. is dealt with in detail in Volume II, but an appreciation of the territorial changes that have taken place



TRIESTE

A panoramic view of one of the potential trouble-spots of Europe. Following the war the territory was placed under United Nations supervision

Photo Picture Post Library

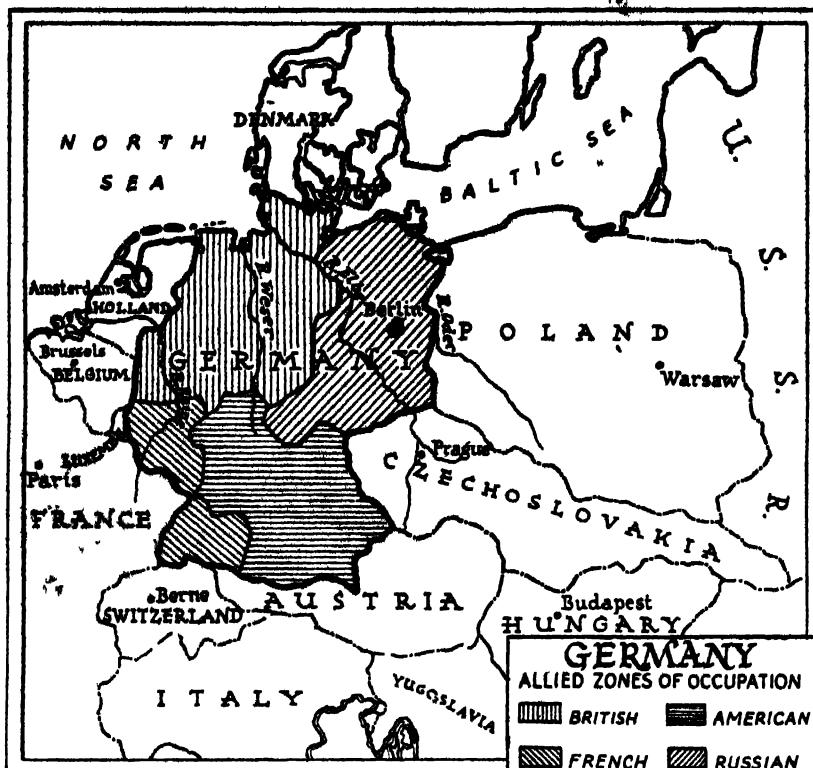
The countries behind the Iron Curtain in Europe include Soviet Russia, Eastern Germany, Poland, Czechoslovakia, Hungary, Romania, Bulgaria, and Albania. Since her expulsion from the Cominform in 1948, Yugoslavia can no longer be numbered among such countries.

To many people in western Europe the abolition of liberty which Communism entails is so repugnant that it is inconceivable that anyone can willingly adopt it. Although in many cases it was not done willingly, yet it must be remembered that in some of the eastern states there has never been such a thing as freedom, certainly not freedom of the Press, and the word for them has nothing like the

in Europe since the war may here be obtained by listing the gains made by the Soviet Union. Between 1939 and 1945 this country annexed the following territories—

	sq. miles
Estonia	18,000
Latvia	25,000
Lithuania	25,500
Part of Finland	17,596
Part of Poland	64,824
Part of Romania (Bessarabia and N. Bukovina)	19,338
Part of Czechoslovakia	4,630
The N.E. part of East Prussia	5,096

In all, the territorial possessions of the



U.S.S.R. in Europe have increased by 180,000 square miles, an area twice the size of the United Kingdom. The population thus annexed totals about 20 millions, which more than compensates for the 7 million Soviet troops killed during the war and approximately 11 million civilians who were killed or died from hunger and exhaustion (no official figure of the Soviet Union's war losses has been given and these figures are conservative estimates).

In addition to these territorial gains, Russia has to all intents and purposes annexed the satellite countries mentioned above. This assimilation was carried out with little outside interference (indeed interference was impossible), and the most powerful opposing forces were the Roman Catholic churches in Hungary, Poland and Czechoslovakia. The only active resistance to the Cominform was that of Marshal Tito in Yugoslavia. His "heresy" resulted in increasing pressure being brought to bear on him. The boycotting of Yugoslavia's products by the Soviet-controlled countries forced her to turn to the western countries for machinery and fuel.

Germany To-day. The question of the future of Germany is the most vital one in Europe to-day. The zoning of Germany by the Potsdam conference in 1945 resulted in the

country being split in two. The Trizone, or Western Germany, came under Allied control and Eastern Germany is under the Soviets. The population of the British, American and French zones is about 45 millions and of the Russian zone 17 millions.

Germany obviously cannot remain indefinitely under military control, yet the Allies cannot afford to withdraw, even were the Russians to do the same, since the latter would remain on the doorstep and might intervene at any time. If Germany is kept permanently shattered, there is the danger that she may go Communist. Re-armed, she may prove to be a staunch ally, yet she might just as easily join forces against the western powers. The Germans have always had a very strong nationalist

spirit and are not likely to suffer gladly the permanent split within their country. The Soviet authorities are afraid of a revived German nationalism, yet they proclaim themselves to be the real protagonists of German unity while the Allies do their best to divide the country.

The western zone was helped considerably by Marshall aid, particularly as regards foodstuffs. The Soviet policy of non-co-operation is exemplified by their blockade of Berlin in 1948 which resulted in a wasteful and expensive air-lift of all foodstuffs and even coal by the Allies. The system worked with extreme efficiency and with no attempt at intervention by the Soviet authorities. It would seem that, since there appears little likelihood of turning Germany Communist at the present time, the Soviet powers will probably hinder all attempts at a satisfactory solution to the innumerable problems that exist, resulting in a weak and disunited country.

Following the setting up of the Bonn government in Western Germany, the Russians formed a so-called Democratic Republic in the eastern zone, whose regime is modelled on that of the other satellite countries. In spite of its name, there have been no efforts to hand over control to the people of Eastern Germany. The Allies,

on the other hand, have pursued a policy of handing back to Western Germany her sovereignty and of gradually modifying and reducing the restrictions imposed on industry, culminating in May, 1952, in the contractual arrangements formally terminating the Occupation Statute and bringing Western Germany into the European defence system.

The biggest problems that the Federal Government in Western Germany have had to tackle have been housing, unemployment, and refugees. Five million new dwellings were needed. Refugees from the eastern to the western zone numbered something like 8 millions, and the employment and housing difficulties entailed may be imagined; in addition there were returning prisoners of war from the U.S.S.R. to be housed, fed and employed.

Before the war, Germany was practically self-supporting as far as foodstuffs were concerned, with the exception, of course, of

tropical products such as tea and coffee. The agricultural output of Western Germany now represents about 85 per cent of the pre-war total, but it must be remembered that the population, including refugees, is now 18 per cent greater than it was at that time. By the end of 1949 all foods were unrationed except sugar, but following the currency reform in June, 1948, the prices of nearly everything doubled during the ensuing year, which meant that in fact rationing still existed except for the rich. In the eastern zone it is estimated that production is only 60 per cent of the pre-war figure; bread is scarce and of poor quality and textiles are very short.

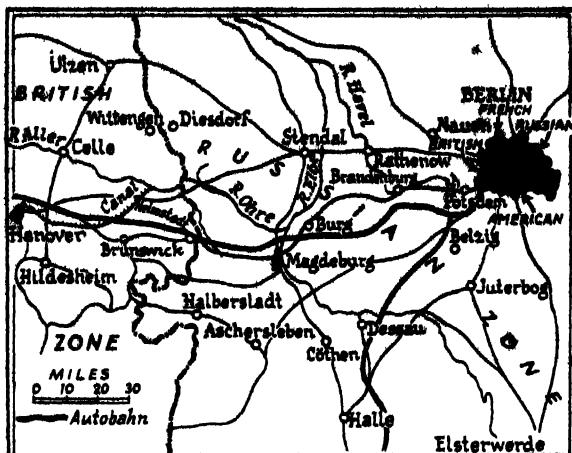
In order to pay for increased imports of raw materials and foods, it is essential for Western Germany to export more manufactured products than she did before the war. This has not yet been achieved, though considerable progress has been made. Western Germany's share in world trade amounts to about 3 per



THE BERLIN "FRONTIER"

A human demarcation line in the Potsdamerplatz formed by regularly-spaced Soviet sector police, who stand at the edge of their sector facing into that of the British

Photo Associated Press



THE SECTORS OF BERLIN

This map also shows the Anglo-Soviet zonal frontier and the communications between Berlin and the British zone

cent at the present time, whereas before the war it was 6 per cent.

The situation in Berlin to-day is that practically everything is duplicated. There are two systems of government: the western senate rules over about two-thirds of the total area of Berlin and just over 2,000,000 people, while the Magistrat in the eastern sector governs a population of 1,600,000. There are two currencies, two systems of education and justice, two police forces, two Presses, two wireless stations, and all the public utilities are duplicated. At the moment there are stringent travel restrictions on people living in the Eastern sector, and traffic between the two zones is checked to prevent exploitation of the higher value of the western mark.

France. During the years following the end of the war, food and fuel were appallingly scarce and expensive in France, and practically everyone was forced to deal in the "Black Market." In 1947 especially, and also in 1948, violent strikes took place. By 1949, however, greater stability had been achieved and food, except for coffee, was unrationed. In spite of price controls, the cost of living persistently rose and is in fact still rising.

During this same year the agricultural position became much better. The output of meat and fats nearly doubled the 1946 figures, and milk and sugar production increased by one-third. Between these years, too, industry got on to a firmer footing: the steel output was doubled and exports rose by 50 per cent. A tragic side to this otherwise rosier picture was presented by the huge forest fires which devastated 112,000 acres of forest in Gironde and

Landes. The following autumn (1950) more bad forest fires raged along the Mediterranean coast, causing much damage to property.

By 1952 the achievements of the first five-year "Monnet Plan" for the equipment and modernization of French industry had become apparent, and the results were so gratifying that a second plan was drawn up. Overall national production had reached a new high peak, and it was estimated that the standard of living of the average Frenchman was 6 per cent higher than in 1939 and as much as 30 per cent higher than immediately after the war.

In 1946 the old colonial terminology was abandoned and the French Union was established to cover France and her former Empire. Four different categories of overseas regions were now recognized. The older colonies became French *départements*, administered as in France herself. These include Algeria (which consists of three *départements*), Réunion, French Guiana, Guadeloupe and Martinique. Others became overseas territories (*territoires d'outre-mer*), which have their own assemblies holding wide powers. The trustee territories are now known as associated territories, and, lastly, the former protectorates are now called associated states. These belong to the Union only by an act of voluntary accession. The total area of the French Union exceeds 5,000,000 square miles with a population of over 137,000,000.

Italy. After the collapse of the Fascist



THE CROWDED MARKET PLACE AT TRIESTE

Its meat and vegetables come largely from farms in the Istrian Isthmus
Photo: Picture Post Library

regime, Communist influence started to make itself felt in Italy. At first this influence was almost entirely confined to the industrial north. By the end of 1949 it had lessened in the north, remained fairly steady in central Italy and started to grow in the very poor districts of the south. In this region no real change in land tenure had been made since medieval times and huge private estates still existed, in some cases neglected by their owners. The peasants were promised that compulsory selling of part of these estates would take place, but since these promises were not fulfilled, disturbances took place in southern Italy and also in Sicily. There have since been several attempts to implement them, notably in 1952. Agrarian reform is particularly needed in Calabria, where deforestation and soil erosion are very bad.

Though agricultural unemployment increased, the general industrial position improved, and the Budget deficit, which reached a peak of 846,000 million lire in 1947-8, declined progressively in the years that followed. The fact

remains that although there are plenty of goods in Italian shops to-day and practically every kind of food can be obtained, the prices are so high that in many parts of Italy the poorer classes cannot buy food and must rely almost entirely on what they are able to produce themselves.

The steady reconstruction of Italy's mercantile marine which has taken place will soon enable her to resume her position in world trade. The discovery of oil at Corte Maggiore south of the Po and the organization of natural gas near Ferrara and at Lodi near Milan should help to reduce the coal imports, which in spite of increasing electrification of industry, have always been a major burden on Italy's trade balance.

Under the terms of the peace treaty, Italy was forced to renounce all rights to her former colonial empire. Libya became an independent state in 1951, and Italian Somaliland is to become a sovereign state by 1959; in the meantime it is placed under international trusteeship with Italy as the administering authority.

